NOVEMBER, 1956

Commercial Fertilizer
and PLANT FOOD INDUSTRY

SIX NEW NITROGEN SOLUTIONS

See page 19

Are you good at figures?
EXAMPLE 1
Valve Bags for Granular or Pulverized Materials
If you increased filling production from 12 per minute to 15 or more per minute — without paying a penny more for sleeve or special insert bags... what would be the percentage of increase — and dollar savings to you — per ton — per hour?
EXAMPLE 2
Open Mouth Bags for Free Flowing Materials
If you increased filling production from 15 per minute to 20 or more per minute — without paying a penny more for your open mouth multiwall bags... what would be the percentage of increase — and dollar savings to you — per ton — per hour?

KRAFT BAG CORPORATION

Gilman Paper Company Subsidiary

630 Fifth Avenue, New York 20, N. Y.
Daily News Bldg., Chicago 6, Ill.

Gilman PAPER CO.
• St. Marys Kraft Corp.
• General Tags Div.
• The Gilbound Corp.
• Kraft Bag Corp.

--check and mail today ---------

- ☐ We are interested in Example 1.
- ☐ We are interested in Example 2.
- ☐ We are interested in both examples.

NAME OF COMPANY_____

ADDRESS_____

CITY_____ ZONE____ STATE_____ PRINCIPAL_____

PRODUCT MFD._____

We have the bags and the packer to effect such savings—*or more!*

Give us the time to give you the facts!

Dependable as a service for 3 generations. Exclusive Sales Agents for the Kraftpacker Automatic Filling Machine and one of the largest integrated producers of multiwall bags with plants in St. Marys, Georgia and Gilman, Vermont, manufacturing every type of multiwall bag in use today!

Make Nutronite

formerly SMIROW

the new sales builder in your fertilizer

NUTRONITE is the quality, natural organic supplement to chemical plant foods.

★ **Valuable to your customers**
because it provides for *controlled release* of plant nutrients for health, steady growth and good color.

★ **Valuable to your dealers**
because it is plainly visible in fertilizer—they can point to it in selling *your* brand.

★ **Valuable to your employees**
because it's less dusty—also no hazard in handling.

★ **Valuable to you**
for all these reasons plus giving you a new sales stimulant in a time of tough competition.

Let us figure the cost of NUTRONITE delivered to your plant.

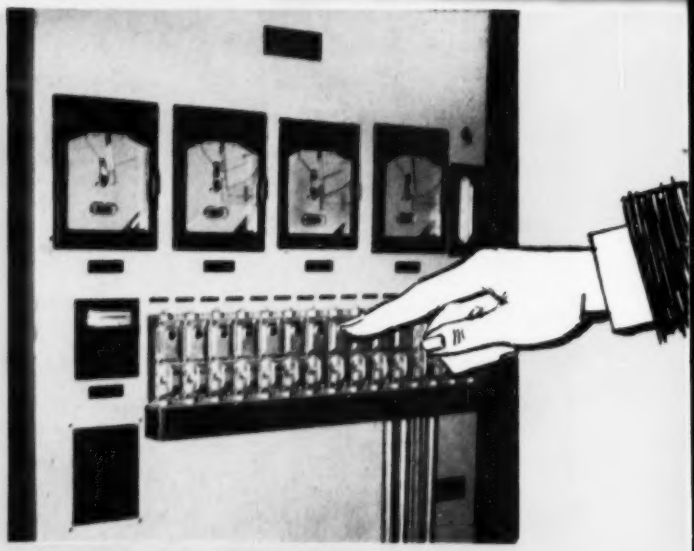
SMITH NUTRONITE ROWLAND

SMITH-ROWLAND CO.
P. O. Box 1219, Norfolk 1, Va.
A DIVISION OF SMITH DOUGLASS COMPANY, INCORPORATED

SELL NUTRONITE FOR LAWNS

Bag straight Nutronite to fill out your line of lawn and garden fertilizers. Golf courses use large quantities, too. Colorful Nutronite bags available, plus merchandising aids. For information, write Smith-Rowland Co., Norfolk, Va.

BE READY TO SWITCH AT WILL!



3-12-12

5-20-20

7-28-28

16-20-0

10-10-10

14-14-14

11-48-0

12-12-12

13-39-0

WHICHEVER WAY THE CAT JUMPS

to WATER SOLUBLE
GRANULATED
PULVERIZED

WITH THE

NEW

WEATHERLY DiaPhos PROCESS

The D. M. WEATHERLY COMPANY

Industrial Engineers and Builders

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and PLANT FOOD INDUSTRY

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COMMERCIAL FERTILIZER and PLANT FOOD INDUSTRY, entered as second class matter, October 12, 1910, at the post office at Atlanta, under the Act of March 3, 1879. Published monthly except semi-monthly in September, by Walter W. Brown Publishing Co., Inc., 75 Third St., N. W., Atlanta 8, Georgia.

Commenting Freely

by Bruce Moran

It is hard to know what to discuss, as the world boils with revolt. But come what may, the people must be fed and it takes fertilizer to do it.

And it takes farmers with skill to use the fertilizer well, on the crops that are most needed. Which leads to the fact that not enough of our young people are being properly trained in the fundamentals of the new, scientific kind of agriculture which is developing all around us.

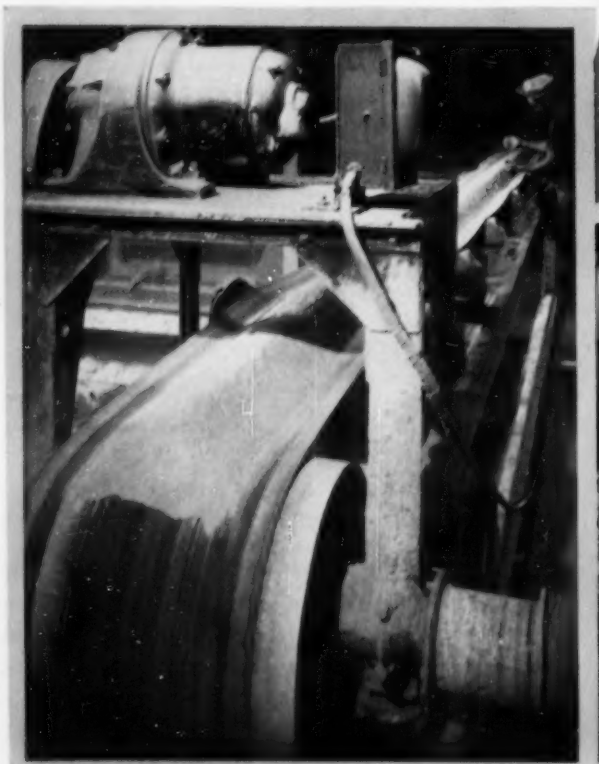
Our agricultural colleges offer a wide range of training along these lines, but they seem to find too few youngsters who realize that what Father knew is not enough for Son, if he is to keep pace, and make his farm pay.

It is a matter our industry should further as we can, because the more trained farmers are out there in the fields, the better the use of our products.

Even after months of storage . . .

"Your triple crumbles like a cookie"

Mr. A. H. ROFFERS, *General Manager* (left) and Mr. W. E. JONES, *Manager* of the Fertilizer Division, Northwest Co-op Mills, Inc., St. Paul, report storing up to 7,500 tons of triple without adverse results.



International's triple goes into more than 20 different mixed fertilizers formulated by the Northwest Co-op Mills. Mixed goods are conveyed by belt to one of 26 bulk storage bins.

Mixed goods produced in the two plants are bagged and sold under the Northwest Co-op name. The fertilizer division, along with feed and seed divisions, serves farm customers in a 5-state area.

"... and saves us 50% on shipping costs"

LIKE all fertilizer manufacturers, Northwest Co-op Mills, Inc., are interested in a top-quality triple that stores with a minimum of setting up. In addition, they want to keep a tight rein on triple super shipping costs.

That's why this modern midwestern firm is an enthusiastic user of International's triple in their two plants at Winona, Minn., and Green Bay, Wis.

"We can store as high as 7,500 tons at a time, and the triple keeps in good condition," says Bill Jones, manager of the co-op's fertilizer division.

The triple goes into more than 20 different fertilizer formulas for co-op customers in Wisconsin, Minnesota, Iowa and the Dakotas.

And International helps hold shipping costs to a minimum too. "We realize 50% savings in transportation costs by International's system of barge shipments through the Gulf of Mexico and up the Mississippi River to Winona," adds Jones.

These big savings in shipping costs are made possible by International's new concept of fast, efficient service. Here's how International's barge shipments, combined with an "on-site" warehousing plan, can help you realize big savings in shipping costs too.

By warehousing triple at storage points located in primary marketing areas, International can assure quick service . . . relieve off-season storage loads at your plant site . . . provide better distribution during peak season.

This new warehousing program includes storage facilities in the St. Paul-Minneapolis area, and three proposed storage sites to be located in key transportation centers. In the areas served by these points, this new service will mean quick, dependable delivery . . . ranging from 24 hours to 3 days.

If you are not already an International user, put us to the test.

You'll find that International's is the triple with built-in extras that help you cut costs. Natural-curing for a minimum of 5 weeks gives you better control of manufacturing conditions . . . helps simplify your formulation problems. And you'll get the extra benefits of a guaranteed constant minimum of 46% APA.

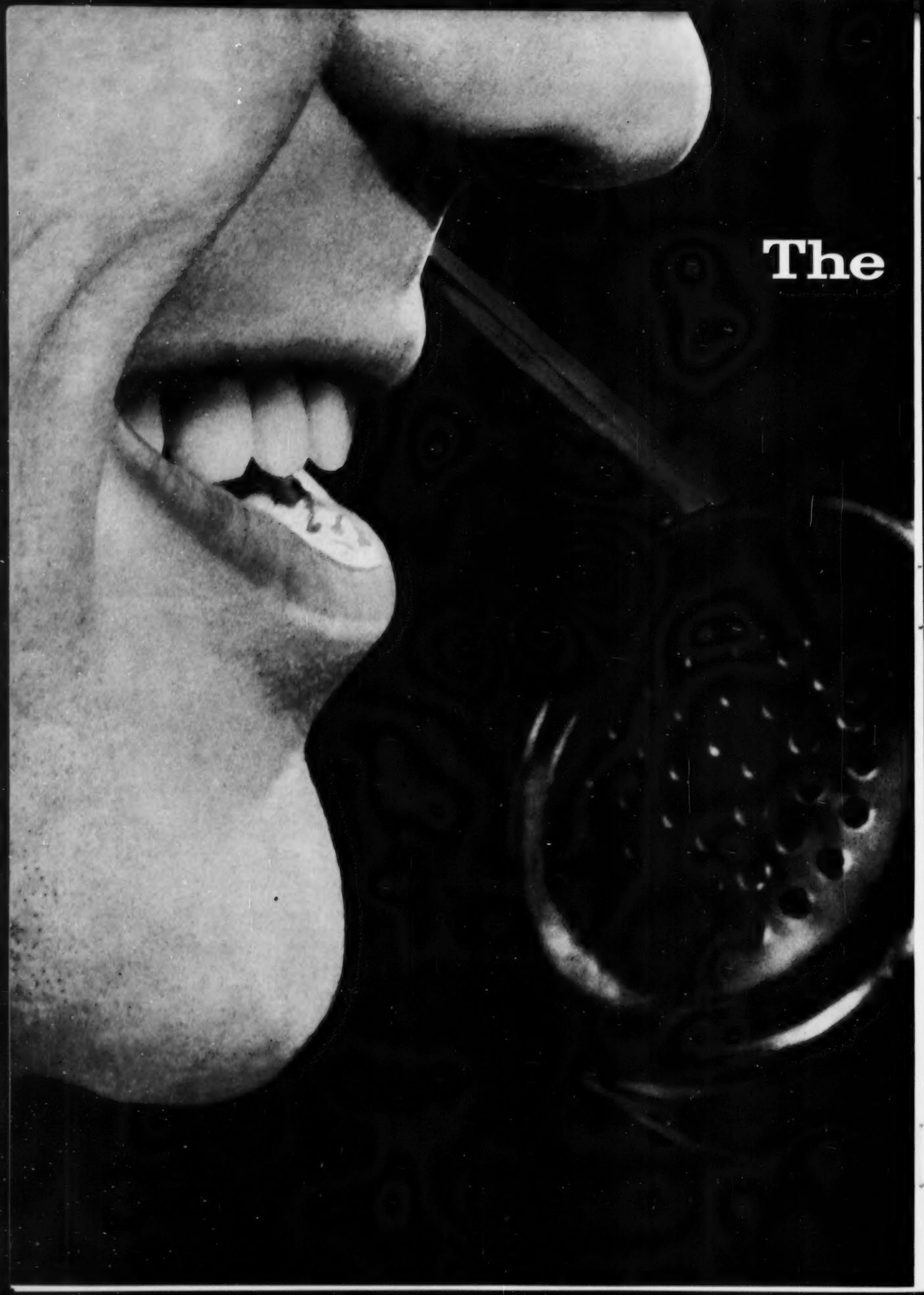
Write or wire International Minerals & Chemical Corporation for full information on prices, shipping and warehousing arrangements.

MINERALS International CHEMICALS

PHOSPHATE CHEMICALS DIVISION

INTERNATIONAL MINERALS & CHEMICAL CORPORATION

General Offices: 20 North Wacker Drive, Chicago 6


The

Man from St. Regis says:

"Get 95% of Weights Accurate within 5 ounces"

Specially designed for packaging fertilizer, the St. Regis 135-AS Model F Bagging Scale gives high production rates, accurate weighing, and easier operation.

Exclusive design features of the St. Regis Fertilizer Scale include stainless steel surfaces on flow chute, flow gate scale bucket and scale-bucket gate to prevent corrosion and fertilizer build-up; and electro-pneumatic controls of standard makes.

Here are some of the ways that the St. Regis Bagging Scale gives you faster, more accurate packaging performance . . .

ACCURACY . . . You get an 18 to 20 bags-per-minute rate with all weights within eight ounces of accuracy . . . 95% of bags within plus or minus 5 ounces of desired weight.

INCREASED PRODUCTION . . . Single-bucket design handles 50-, 80-, and 100-pound bags . . . allows quick cleanout, minimum downtime for grade changes . . . weighs up to 20 bags per minute!

SAVINGS . . . The St. Regis Automatic Bagging Scale prevents wasteful overfilling . . . exclusive design features lower maintenance costs.

Southern Cotton Oil Company's Pensacola plant averages up to 15 100-pound bags per minute on this line equipped with a St. Regis 135-AS Model F Automatic Bagging Scale. Says J. T. Murphy, Manager . . . "not only is our packing rate higher, but output remains high when we are making as many as 30 grade changes a day."

St. Regis
PAPER COMPANY

Behind the Man from St. Regis stand experts in every field of packaging, ready to serve you.

Multiwall Packaging Division
St. Regis Paper Company, Dept. C.F.-1156
150 East 42nd Street
New York 17, N. Y.

Please send me free illustrated booklet on the St. Regis 135-AS Model F Automatic Bagging Scale.

Name _____ **Title** _____

Firm _____

Address _____

City _____ **State** _____

JUST AROUND THE CORNER *by Vernon Mount*

SUEZ' IMPORTANCE to us may be measured several ways:

Two thirds of America's horsepower of all kinds is generated from oil. And there's no need to explain the relationship between oil and Suez.

Our best friend, England, is as dependent as we are on oil.

Our worst friend, Russia, would like to see us without oil.

In the event of war, our mechanized defenses would rapidly become helpless as our domestic oil resources became inadequate.

SOMETIMES we hear people saying we should keep our noses out of foreign affairs. I mention this Suez matter as an example of why we don't do it, won't do it, can't do it.

Yours faithfully,

Vernon Mount

SEND FOR YOUR BOOKLET

"The Installation and Operation of a Nitrogen Solution System" to P. O. Box 4628, Atlanta 2, Ga.

KNOW you are RIGHT and get

A COMPLETE PACKAGE

NO PROBLEMS by ordering from one source

NO WORRIES Our system has no flaws

Nitrogen Solution System

We have been handling Nitrogen Solution problems for 20 years. Don't depend on a source who knows nothing of your problems. We can give you tested and guaranteed valves, pipe, fittings and all the miscellaneous items you need on one order. Call, Write or Wire J. A. (Joe) Naylor and know you are right.

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and Agriculture

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PHOSPHATE ROCK

- for the manufacture of complete fertilizers
- for the manufacture of industrial chemicals
- ground rock phosphate for direct application to the soil

International Minerals & Chemical

PHOSPHATE MINERALS DIVISION

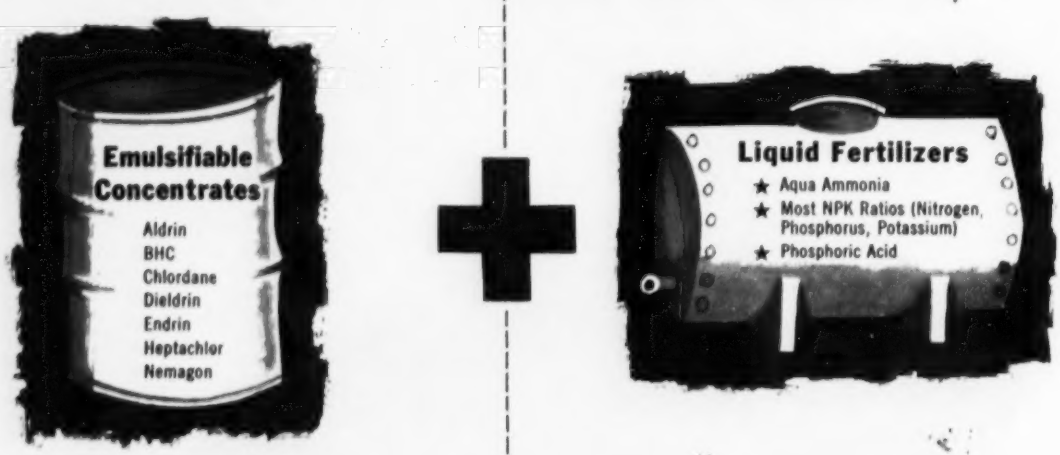
INTERNATIONAL MINERALS & CHEMICAL CORPORATION

General Offices: 20 North Wacker Drive, Chicago 6 • Phosphate Mines and Plants in Florida at Noralyn, Peace Valley, Achan, Mulberry; in Tennessee at Mt. Pleasant and Wales

with practically no limitations

NOW! You Can Field Mix

Liquid Fertilizers and Pesticides



with the Versatile EMCOLS H-A H-B *Emulsifiers*

Further advantages of this novel system:

1. Emulsifiable pesticide concentrates are compatible in liquid fertilizers regardless of sources of NPK (Nitrogen, Phosphorus, Potassium).
2. Emulsions are easily formed with minimum agitation.
3. Maximum flexibility is provided for controlling pesticide-fertilizer dosages in mixed crop requirements.
4. Pesticide concentrates are also suitable for conventional aqueous spray applications in case of carry-over stock.

All these advantages make this novel system economically attractive to formulators, applicators and growers.

For further technical information, contact your local Emulsol representative, or write direct to

EMULSOL CHEMICAL CORPORATION
division of the Witco Chemical Company
59 EAST MADISON STREET • CHICAGO 3, ILLINOIS, U.S.A.

VORHES CHEMICAL CORPORATION GETS OUTSTANDING PERFORMANCE FROM UNION'S I & C BAGGER

"We wouldn't trade this machine for any piece of equipment we have in the plant"

Ends "rush season" production worries, brings about greatest savings, fertilizer executives report.

SOLVES RUSH SEASON SHIPPING PROBLEMS

"The UB-101 machine has proved to be more than adequate in every phase of performance."

P. L. Etheredge, Secretary-Treasurer
Etheredge Guano Company, Inc.
Augusta, Ga.

ELIMINATES ALL OVER TIME

"We were able to eliminate all overtime during the past two seasons, which I am convinced more than compensated us for the small cost of the baggers.

"The speed and accuracy of these units made the many thousands of tons we handled during the rush period a pleasure.

"One of the most significant features is the lack of maintenance. The amount we have expended would not exceed $25 for the past two years."

C. P. Belding, Superintendent
F. S. Royster Guano Company
Athens, Ga.

PRODUCTION UP 50%... LABOR SAVINGS 33%

"Union's I & C Bagger has enabled us to increase production to 50 to 60 tons per hour, compared with 35 to 40 tons in the past, and we are able to do it with two men instead of three. Union's Bagger is as fast and efficient a bagger as I've ever encountered. Its performance has been little short of sensational."

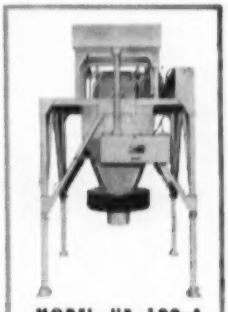
C. L. Durham, Plant Superintendent
Dixie Guano Co., Laurinburg, N. C.

F. Robert Kerrigan
Production Manager
Vorhes Chemical Corporation
Charles City, Iowa

"The I & C Automatic Open Mouth Bagger gives us one of the most accurate jobs of weighing, and is one of the easiest pieces of equipment we have to maintain. We have consistently maintained speeds of 22 bags per minute. In short, we wouldn't trade this machine for any piece of equipment we have in the plant."

Vorhes Chemical's experience is typical of many fertilizer manufacturers. More than 300 of Union's I & C Baggers have been installed in this industry during the past two years alone. This automatic and practically fool-proof high speed equipment usually pays for itself in full, through savings alone, in a remarkably short period of time.

We will be glad to demonstrate with actual figures based on recent fertilizer installations.



MODEL UB 100-A (Double Beam Scale) for accurate, high speed weighing of granular materials

NEW! SEND FOR UNION'S AUTHORITATIVE AND PRACTICAL "FERTILIZER PACKAGING WORK KIT"

Package Engineering Department
Union Bag-Camp Paper Corporation
233 Broadway, New York 7, N. Y.

Please send immediately your new "Fertilizer Packaging Work Kit" which includes a new calculator for figuring our bagging cost-per-ton. I understand there is no charge or obligation.

Name ..... Title .....

Company .....

Address .....

City ..... Zone ..... State .....

UNION'S I & C BAGGER

Automatic Weighing and Filling Machine for Open Mouth Bags

Manufactured by INGLETT & CORLEY, INC., AUGUSTA, GA.
Exclusive Sales Agents:
PACKAGE ENGINEERING DEPARTMENT
UNION BAG-CAMP PAPER Corporation
233 Broadway, New York 7, N. Y.

THIS symbol stands for high-grade coarse and uniform Muriate of Potash (60% K_2O minimum). Southwest Potash Corporation provides a dependable supply of HIGH-K* Muriate for the plant food industry.

*Trade Mark

Southwest Potash Corporation

61 BROADWAY • NEW YORK 6, N. Y.

AMERICAN SOCIETY OF AGRICULTURAL ENGINEERS
Power and Machinery Section
In cooperation with the National Joint Committee on Fertilizer Application
Edgewater Beach Hotel, Chicago, Ill.

Wednesday, December 12, 1956

Presiding: C. E. Guelle, Vice Chairman, National Joint Committee on Fertilizer Application.

9:30 A.M. Fertilizer Placement—Soils and Plant Nutrition Problems—Firman E. Bear, Rutgers University.

Engineering Problems — H. B. Walker, University of California.

10:45 A.M. 15-Minute Recess.

11:00 A.M. Machinery for Fertilizer Placement—W. C. Hulburt, USDA.

2:00 P.M. Fertilizer Placement for Grain Seedings in Permanent Sods L. N. Wise and T. N. Jones, Mississippi State College.

2:30 P.M. Trends in the Use of Liquid Fertilizers—William R. Bone, Monsanto Chemical Company.

3:00 P.M. Developments in the Application of Liquid Fertilizers—H. F. Miller and C. W. Gantt, USDA.

3:30 P.M. Phosphorus Solubility, Particle Size and Placement, as Related to the Uptake of Fertilizer Phosphorus and Crop Yields—R. L. Cook, Kirk Lawton, L. S. Robertson, and C. M. Hansen, Michigan State University.

4:15 P.M. Adjournment.

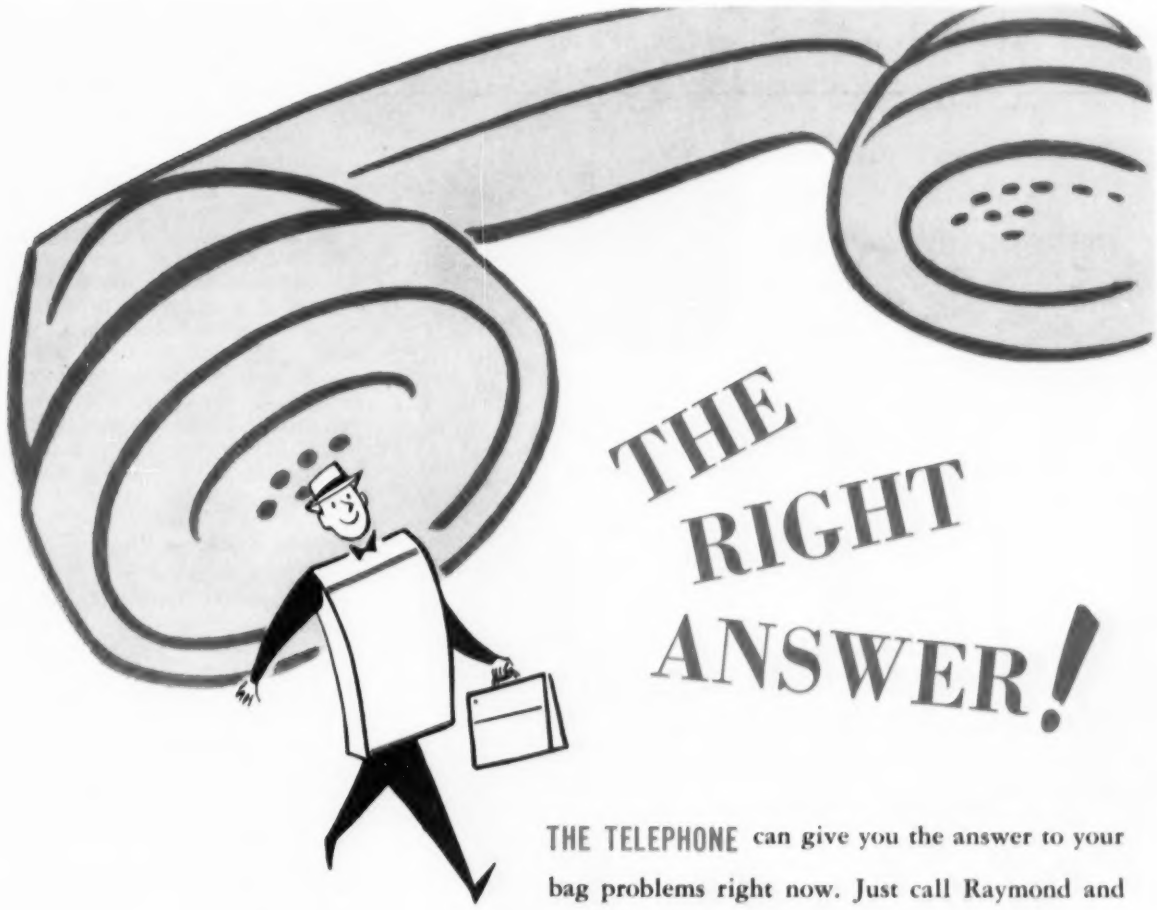
USDA Research Groups Ask Recommendations

The U. S. Department of Agriculture today invited interested organizations to submit suggestions concerning the Federal program of agricultural research to the 25 USDA research and marketing advisory committees, which began their tenth year of annual meetings in October.

TVA Offers Industry Experimental Materials

In response to many requests, any interested fertilizer manufacturing company in the United States outside the Tennessee Valley can now experiment with new TVA fertilizer materials.

For the coming fertilizer season, fertilizer plants around the country can now obtain up to 100 tons during any fiscal year of each of TVA's two newest fertilizer materials. They are for use in the manufacture of high analysis mixtures, for making new products or for experimenting



THE RIGHT ANSWER!

THE TELEPHONE can give you the answer to your bag problems right now. Just call Raymond and top-flight talent in the bag and paper industry will go to work for you—*fast!*

Albemarle's great mills assure you every type of paper for every "bagable" product. Multi-colored printing, in perfect register, makes your bag a bright, colorful "salesman."

And most important—quick deliveries where, when and as often as needed.

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MULTIWALLS

RAYMOND BAG CORPORATION
Albemarle Division of PAPER MFG. COMPANY
Middletown, Ohio • Richmond, Va.

. . . AND GET
HIGH QUALITY UREA
NITROGEN— PLUS
SPEEDY DEPENDABLE SERVICE
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CALL FOR
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VITREA CUSTOMERS ARE SATISFIED CUSTOMERS
because Vitrea means:
✓ Fewer bags to handle and store—45% N
✓ Quick acting, yet longer lasting UREA NITROGEN
✓ Dust free, free flowing pellets
✓ All-purpose nitrogen . . . ideal for fall plow-down and top dressing
✓ Highest yields . . . and profits
Stock up NOW with high quality JOHN DEERE VITREA.
JOHN DEERE
Grand River Chemical Division of
DEERE & COMPANY
2010 SOUTH UTICA • TULSA, OKLAHOMA

in the use of new fertilizer processes.

Products available are calcium metaphosphate with an analysis of 60 to 62 per cent available P_2O_5 and diammonium phosphate analyzing 21-53-0. Both materials are available in bulk or in 80-pound bags.

Dr. Leland G. Allbaugh, director of TVA's Division of Agricultural Relations, says that applications will be studied to see if the firm's proposals can effect economies in fertilizer production, or have experimental and educational value. Application forms are available from the Chief, Fertilizer Distribution Branch, Tennessee Valley Authority, New Sprankle Building, Knoxville, Tenn.

Florida Bankers Issue Fertilizer Booklet

A new leaflet entitled "The Florida Bankers Association Advocates Good Soil Fertility Practices Because . . . " has been prepared by the University of Florida and the National Plant Food Institute, especially for the Florida Bankers Association, Dr. Russell Coleman, executive vice president of the Institute has announced.

Dr. Coleman said that this project was made possible largely through the work of Dr. F. B. Smith, Head of the Department of Soils, University of Florida. Of the 40,000 leaflets printed, 35,000 will be distributed through the Florida Bankers Association; and 5,000, through the University of Florida.

Potash Institute Sponsors FFA

Efficient cotton production won all-expense paid trips to the national Future Farmers of America convention for six boys. Unlike other production contests which are based on "yield-per-acre," competition in this program, sponsored by the American Potash Institute is judged on (1) efficiency of production, and (2) practices applied most nearly in keeping with vocational agriculture teachings.

Willan Heads CACA

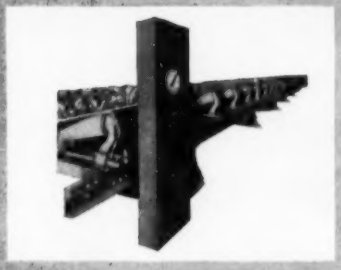
G. E. Willan of Burlington was elected president of the Canadian Agricultural Chemical Association at its Niagara Falls convention.

Other officers elected are: A. W. Hutchison, Toronto, first vice president; M. E. Ward, Montreal, second vice president; J. H. Elliott, West Hill, Ont., secretary; S. R. Stovel, Toronto, treasurer.

GRANULATING? COATING?

TECHNICAL DATA

CONVEYOFLO® METER: for any belt conveyed material . . . automatically paces auxiliary feeders . . . meters total plant output. For installation in existing conveyors . . . as furnished complete with conveyor unit.



BUILDERS CONVEYOFLO METER

Features: compactness, continuous integration, accurate response to load variations. Accuracy within ±0.4 of 1% of full scale over 10:1 range. Overload protection, automatic compensation, inherent explosion-proof design.

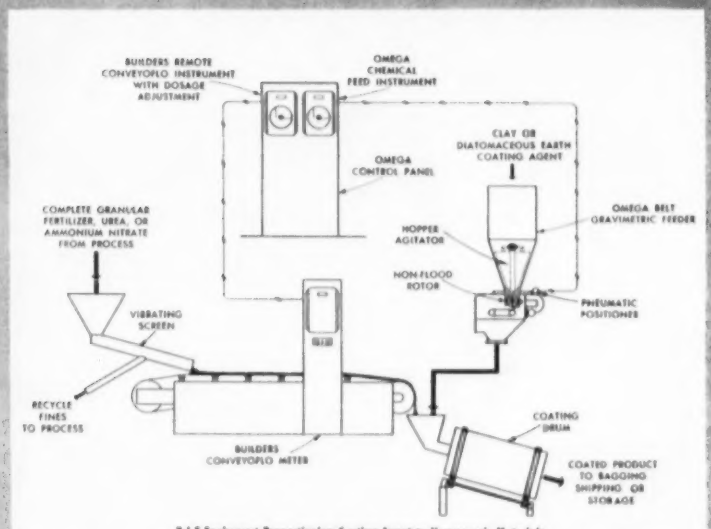
GRAVIMETRIC FEEDER: Accurate, rugged dry materials feeder for medium feed rates. Features: feed rates to 2 cu. ft./min.; accuracy within ±1% by weight over full 100 to 1 feed range; large weight-sensing section; no belt slippage or training; non-flood rotor;

OMEGA GRAVIMETRIC FEEDER

rapid rate setting; Sens-A-Gram controller; sampling gate optional.

RELATED EQUIPMENT for compounding fertilizers: **ROTODIP LIQUID FEEDER** — for feeding unrefined phosphoric acid in superphosphate production; **HI-WEIGH BELT GRAVIMETRIC FEEDER** — for continuously weighing and feeding medium to high rates.

"THE BEST COSTS LESS"


BUILDERS REMOTE CONVEYOFLO INSTRUMENT WITH DOSAGE ADJUSTMENT
OMEGA CHEMICAL FEED INSTRUMENT
CLAY OR DIATOMACEOUS EARTH COATING AGENT
OMEGA CONTROL PANEL
COMPLETE GRANULAR FERTILIZER, UREA, OR AMMONIUM NITRATE FROM PROCESS
OMEGA BELT GRAVIMETRIC FEEDER
HOPPER AGITATOR
NON-FLOOD ROTOR
PNEUMATIC POSITIONER
VIBRATING SCREEN
RECYCLE FINES TO PROCESS
COATING DRUM
BUILDERS CONVEYOFLO METER
COATED PRODUCT TO BAGGING SHIPPING OR STORAGE

B-I-F Equipment Proportioning Coating Agent to Hygroscopic Materials

CUT COATING COSTS THE OMEGA WAY!

THE PROBLEM:

The current trend toward granulated fertilizers . . . based on multi-component formulas . . . makes it essential to select proper automation-type conveyor equipment to achieve the high compounding accuracies and production rates required. Also with the increased demand for higher and higher analysis granular plant foods, the need for a system which can properly and efficiently coat hygroscopic granules or prills with a parting agent (clay or diatomaceous earth) increases.

THE ANSWER:

OMEGA MACHINE COMPANY, as a leading manufacturer of this type of equipment, has the design, manufacturing, and installation experience to help you increase the profit factor of your formulating process. *Coating costs can be cut* by the Omega performance-proved proportioning system . . . with coating material fed from the Model 50-8R *non-flooding*, gravimetric belt feeder to the product stream being weighed by Builders Conveyoflo®, and proportioned in accurately controlled ratio. Outstanding features on two such units which work for your benefit are listed under TECHNICAL DATA. Increase your competitive advantage by making your operation as modern as tomorrow!

ACT TODAY!

For Bulletins write **OMEGA MACHINE COMPANY, 538** Harris Avenue, Providence, R. I. . . . division of . . .

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BUILDERS IRON FOUNDRY • PROPORTIONEERS, INC. • OMEGA MACHINE CO. • BUILDERS-PROVIDENCE, INC.

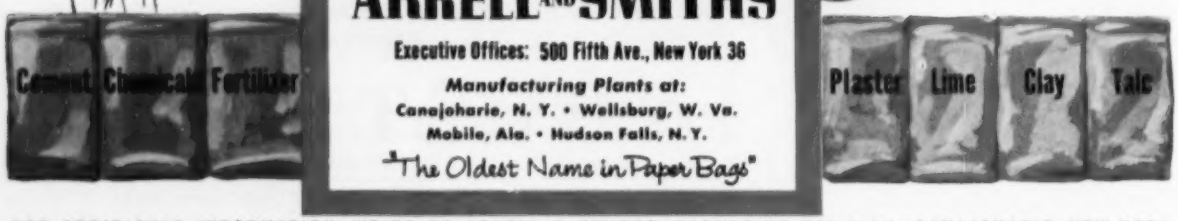
here's the Biggest News in the Fertilizer Industry

This revolutionary multi-wall is a real advancement in the science of bag closure. Unlike ordinary multi-wall pasted valve bags, the Arkell & Smiths "Step-Flex" Bag is triple-sealed top and bottom to eliminate sifting of fine materials. The plies forming the multi-wall construction are staggered on the ends, and each ply on one side of the bag is pasted to the corresponding ply that it overlaps on the opposite side of the bag . . . at both top and bottom.

This improved construction forms a positive sift-proof seal and actually makes the top and bottom of the bag even stronger than the walls!

Since the size of the orders for this new bag are increasing daily, we recommend that you let us know your requirements immediately! Write, wire or phone today.

P.S. There is no upcharge for the triple-sealed "Step-Flex" Bag.



ARKELL AND SMITHS

Executive Offices: 500 Fifth Ave., New York 36

Manufacturing Plants at:

Canajoharie, N. Y. • Wellsburg, W. Va.
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"The Oldest Name in Paper Bags"

FOR ADDITIONAL INFORMATION, WRITE TO ARKELL & SMITHS, PACKAGING DIVISION, CANAJOHARIE, NEW YORK

Arcadian® News

Volume 1 | For Manufacturers of Mixed Fertilizers | Number 1

SIX NEW NITROGEN SOLUTIONS improve fertilizer quality and cut freight and drying costs

Water squeezed out of new solutions to cut shipping costs as much as 15%

SIMPLIFY PRODUCTION OF MODERN GRANULAR OR SEMI-GRANULAR GOODS

Production of the popular, dustless, non-caking granular-type mixed fertilizers is easier and more economical with new, more concentrated NITRANA® and URANA® Nitrogen Solutions. These six new Nitrogen Division Solutions make a total of 16 Solutions available from Nitrogen Division plants to give fertilizer manufacturers greater flexibility in operation than ever before.

Since the new solutions contain less water, your saving on freight alone can run as high as fifteen per cent. Less water has to be removed from the fertilizer after mixing. Our technical service representatives are always available to assist you in the selection, handling and formulation of the most suitable Nitrogen Solution for your particular fertilizer production—your call will be given prompt attention.

New NITRANA 2M, 3M, 3MC and 7 Solutions, like NITRANA 2, 3, 4 and 6, are composed of ammonium nitrate dissolved in ammonia and water. The characteristics of these solutions are shown in the table at right.

New URANA 11 and 13 Solutions, like URANA 10, 11 and 15, are composed of both urea and ammonium nitrate in ammonia and water. (See table.) Since they provide water-soluble organic nitrogen as well as ammonia and nitrate nitrogen, they are excellent for producing semi-granular and organic nitrogen fertilizer grades.

These solutions provide easier, more economical handling, excellent ammoniation, good particle agglomeration, and quick curing with less caking.

Prompt service on the new solutions is being made available from Nitrogen Division plants at Hopewell, Va., Ironton, Ohio, and Omaha, Neb. In-transit service helps assure speedy arrival of shipments in many additional areas. For full details, consult your Nitrogen Division technical service representative.

Concentrated new solutions assure greater flexibility in producing granular and semi-granular fertilizers.

	New NITRANA Solutions				New URANA Solutions	
PER CENT BY WEIGHT	**2M**	**3M**	**3MC**	**7**	**11**	**13**
Free ammonia	23.8	28.0	29.7	26.0	19.0	33.0
Ammonium nitrate	69.8	60.0	64.5	68.0	58.0	45.1
Urea	—	—	—	—	11.0	13.0
Water	6.4	12.0	5.8	6.0	12.0	8.9
NITROGEN BY WEIGHT						
Free Ammonia N	19.57	23.02	24.43	21.37	15.62	27.15
Ammonia N, combined	12.22	10.50	11.28	11.90	10.15	7.89
Nitrate N	12.22	10.50	11.29	11.90	10.15	7.89
Urea N	—	—	—	—	5.12	6.07
Total N	44.01	44.02	47.0	45.17	41.04	49.0
Specific Gravity at 60°F/60°F	1.147	1.083	1.089	1.125	1.162	1.033
Lbs. per gal. at 60°F	9.56	9.03	9.08	9.38	9.69	8.61
Lbs. N per gal.	4.21	3.98	4.27	4.24	3.98	4.22
Vapor pressure psig at 104°F	18	25	34	24	10	51
Salting out Temperature, °F	26	−36	−30	−6	7	−17

Test Forest Fertilization as a Promising Big New Market

NEED CAREFUL YIELD AND COST DATA TO DETERMINE PROFITS FROM TREE-FEEDING

One airplane, with simple equipment, can fertilize hundreds of acres of forest per day. Trees, like other crops, need plant foods to make vigorous, healthy growth. To build this promising new market for fertilizers, we have to find out how well it pays to feed forest trees.

Recent tests of fertilizing trees have indicated increases in growth ranging from 40 to 65 per cent. Current, larger-scale work is directed toward improving techniques of fertilization. Crop dusting planes have been used where landing space is available. In rugged mountain terrain, helicopters have proved more effective.

Now in the United States

Fertilizing of trees to get a greater volume of wood quicker is new in the United States, although it has been done for some time in parts of Europe where wood has been in short supply for centuries. Potash and nitrogen have proved especially important for many forest soils. Fertilizer produces more wood per acre and knocks several years off the time required to grow saleable wood for timber or pulp. Fertilizer also has certain advantages for Christmas tree production.

Most of the reports on plant food for trees pay little attention to the dollar and cent benefits. Recent tests are aimed to determine the practical values of forest fertilization. In one such test, Rutgers University Forestry Department, in cooperation with Nitrogen Division, is checking the value of 400 pounds of 12-12-12 per acre on a red pine plantation at Beemerville, New Jersey.

Provides Many Benefits

Besides providing a new market for the fertilizer industry, forest feeding gives crop dusters the prospect of a new, less hazardous custom application program. Airplane fertilization of forests, inaccessible to ground equipment, can greatly improve ground cover and increase wild life. This should interest hunters and conservationists. Farmers, pulp and paper firms and other woodland owners stand to gain the greatest benefits. For the latest information on forest fertilizer developments, write to Nitrogen Division, Allied Chemical & Dye Corporation, 40 Rector St., New York 6, N. Y.

Farm Editor Points Out Fertilizer is Better Buy Than High-Priced Land

Farmers are in danger of paying too much for land, says Paul C. Johnson, Editor of Prairie Farmer magazine. High-priced land, subject to high taxation, can let farmers down badly, because land is less important in the farm production picture than it has ever been.

Farmers don't pay taxes on fertilizer. And from your customers' own experience, you know fertilizers can often improve crop yields on average land to equal yields on the most expensive land available.

Winter Cell Division Explains Why Grain Needs Fertilizer Now

Down inside the overwintering wheat plants, cell division speeds up as spring approaches. The cells which initiate wheat heads and determine maximum yields are often formed before spring top-dressing of nitrogen can be applied. Winter or fall application of nitrogen, or use of a high-nitrogen 1-1-1 fertilizer, makes sure the grain has enough nitrogen at this critical stage. Even if the soil is too wet or too soft for winter or early spring top-dressing, the crop has all the plant food it needs.

Nitrogen also improves stooling out, makes longer grain heads and bigger kernels, and increases the protein content of the grain. It helps make the leaves bigger and greener to provide the food to make heavier, bigger grain crops. Your customers can profit by using fertilizer on wheat before spring.

NITROGEN DIVISION CONTINUES CAMPAIGN TELLING MILLIONS OF FARMERS FERTILIZER GROWS PROFITS

The powerful, full-page, two-color advertisements shown above are part of a continuing series appearing in leading farm magazines. This campaign, spelling out the profits to be made in farming with more fertilizer, is conducted by Nitrogen Division as a service to the entire fertilizer industry.

Each of these messages describing the benefits of wise use of fertilizer reaches 3½ million readers of farm magazines. Each advertisement tells how fertilizer helps your customers grow bigger yields of crops at lower cost, to assure a bigger return from land, labor, machinery and management. Because the price of fertilizer has not gone up like the prices of most other things farmers must purchase to grow crops, these ads say fertilizer is the farmer's best buy today.

This series, instituted a year ago, is continuing through the winter season and on into the 1957 farm fertilizer buying year. It stresses ordering enough fertilizer, ordering early and accepting early delivery. In every one of these advertisements, farmers are urged to "see your fertilizer dealer." This campaign is designed to help you in your service to farmers. To make it work better, send your comments and suggestions to Nitrogen Division.

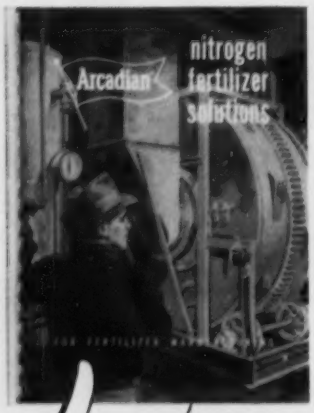
Agronomists Favor Manufacture of Fewer Grades of Mixed Fertilizer

About 15 fertilizer ratios, plus straight materials, are all we need for the entire country, according to Lewis B. Nelson of the U.S.D.A. Agricultural Research Service at Beltsville. By limiting analysis to no less than about 24 plant food units per ton, we might average about 3 grades per ratio, or a total of 45 grades.

Such simplification would be a big benefit to both manufacturers and farmers, and still give them plenty of leeway for good crop feeding.

In Minnesota, for example, soil tests show that 90 per cent of the fertilizer recommendations can be made with 8 or 10 ratios. In New York, about 90 per cent of the mixed fertilizer sold is made of 5 ratios now recommended. In Kansas, 5 ratios will cover most farming needs. Even in the complex of California soils and crops, straight materials, plus 5 basic ratios can satisfy most needs.

Arcadian News for Fertilizer Manufacturers . . . . . from NITROGEN DIVISION



Big, new 48-page technical solutions handbook gives full use data.

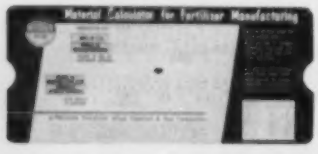
How to make fertilizer enriched with N-dure Urea-formaldehyde solution.

Formulation pad speeds figuring in fertilizer production.

Up-to-date guide to fertilizer terminology (issued annually).

Handy memo pads and notebooks imprinted with the ARCADIAN flag.

New, useful slide rule for quick fertilizer calculations.



See Our TECHNICAL SERVICE Representative

for any of these useful aids to fertilizer manufacturers shown at the left. Our technical men, skilled in production *know-how* are always on call for customers.

Arcadian®

Products for Fertilizer Manufacturers

Nitrogen Solutions:

URANA®
NITRANA®
U-A-S*
N-dure*

Other Nitrogen Products:

Anhydrous Ammonia
Urea Products
A-N-L®
Ammonium Nitrate
Sulphate of Ammonia
American Nitrate of Soda

*Trade-mark

NITROGEN DIVISION

NITROGEN DIVISION
Allied Chemical & Dye Corporation

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Hopewell, Va.
Ironton, Ohio
Omaha 7, Neb.
Columbia, Mo.
Kalamazoo, Mich.
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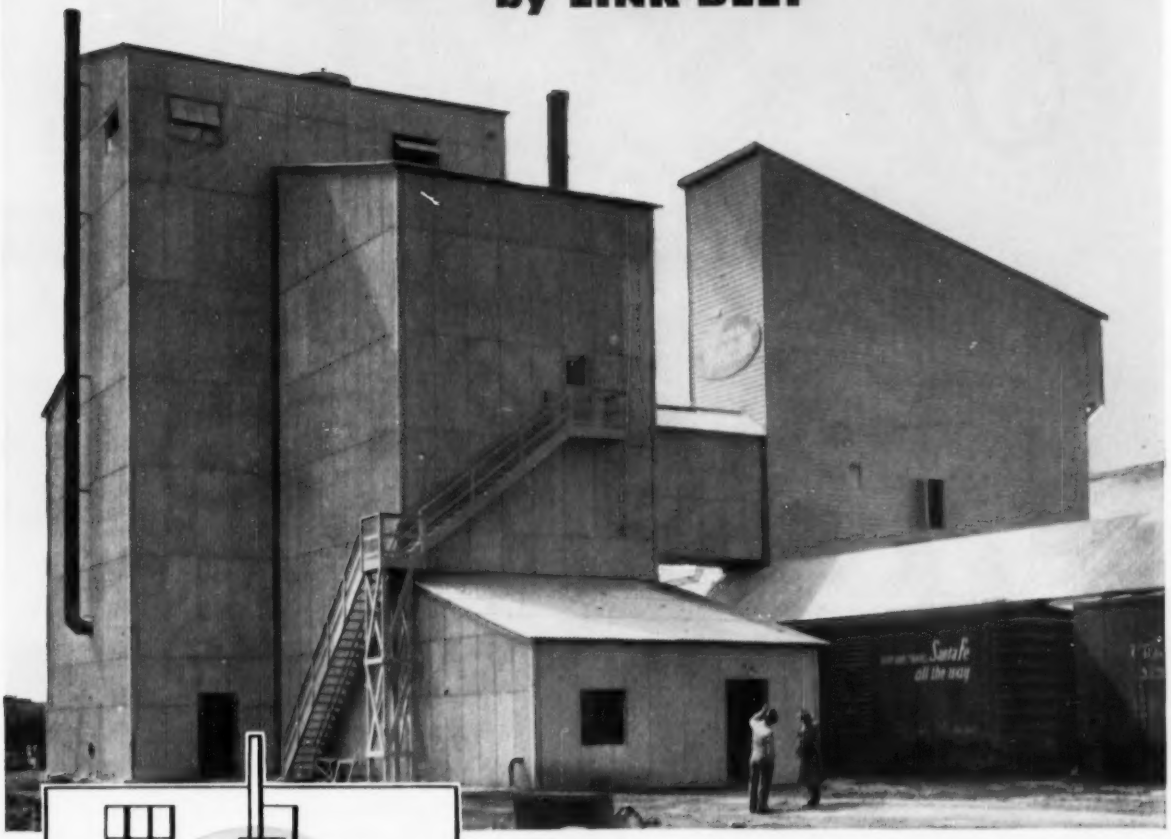
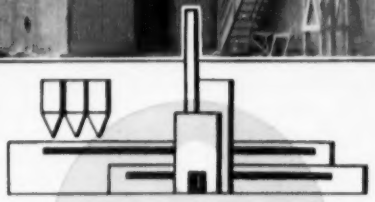
3rd GRANULAR FERTILIZER PLANT
furnished for Federal Chemical by LINK-BELT



40 TONS OF MIXED FERTILIZER are produced hourly at Federal's new Danville (Ill.) plant. Process utilizes anhydrous ammonia and ammonium nitrate solutions.



LINK-BELT "turn-key" SERVICE unlocks new efficiencies in fertilizer production

Under this inclusive 5-point program, LINK-BELT will:

1. **PILOT THE PROCESS,** using our complete laboratory and test facilities.
2. **DESIGN THE SYSTEM** as an efficient, integrated operation conforming to your exact needs.
3. **FABRICATE THE EQUIPMENT.** Link-Belt makes a complete line—will also supply special requirements.
4. **ERECT THE PLANT,** providing crews and supervisory service.
5. **START THE OPERATION,** with field engineers ready to make final adjustments.

Supplies handling and processing equipment to put TVA continuous ammoniator system "on stream"

PROVED in two previous Federal Chemical Company plants, Link-Belt equipment was chosen for a third installation. And this same top performance and efficiency was achieved to produce top-grade fertilizer at low cost.

Link-Belt will work with your own constructors to design and equip a new plant—or modernize your present system. Or we can handle complete erection under a single *"turn-key"* contract.

Link-Belt offers a complete line of handling and processing equipment plus broad experience in the production of every type of fertilizer. Whether you produce dry-mix, superphosphate, ammonium phosphate, ammonium nitrate, ammonium sulphate, urea or granular — call your nearest Link-Belt office. Or write for Book 2459.

LINK-BELT

PLANTS AND EQUIPMENT FOR THE FERTILIZER INDUSTRY

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants and Sales Offices in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World. 14,229

FOR A LONG, LONG TIME

TRIPLE SUPERPHOSPHATE

Fine Texture, Small Particle Size For Maximum Ammoniation-Granulation

RIGID QUALITY CONTROL
Through Six Basic Chemical and Physical Analysis

HIGH WATER SOLUBILITY
High Water Solubility is a Characteristic of all 3 Grades

RUN-OF-PILE
Fine Texture, Highest Porosity, Large Surface Area, Small Particle Size, for Maximum Ammoniation-Granulation.

GRANULAR
Dust Free, Free Flowing, Uniform Particle Size, Medium Hardness, No Bridging Over, for Direct Soil Application.

COARSE
For Intermediate Ammoniation to Produce a Semi-Granular Product. Also Affords Excellent Compatable Mixing with Granular Potash, for Minimum Segregation, in Alkaline Grades.

Thirty years ago when the use of Triple Superphosphate in the fertilizer industry was in its infancy, we produced our first run of Triple Superphosphate. Since that beginning we have been producing, and supplying this great and growing fertilizer industry with a Triple Superphosphate as fine as is available. Today in the country's largest and most modern Triple Superphosphate plants, we produce through pin-point control in step-by-step processing from the raw material to the finished product a triple superphosphate of:

FINE TEXTURE
SMALL PARTICLE SIZE
46% AVAILABLE P_2O_5
PRE-SHIPPING CONDITIONED

There's a BRADLEY & BAKER office near you. Their representative would be pleased to consult with you on your requirements and to advise on your most convenient delivery routings.

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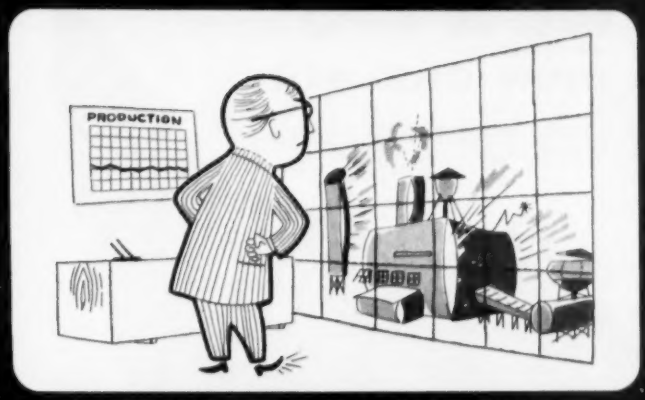
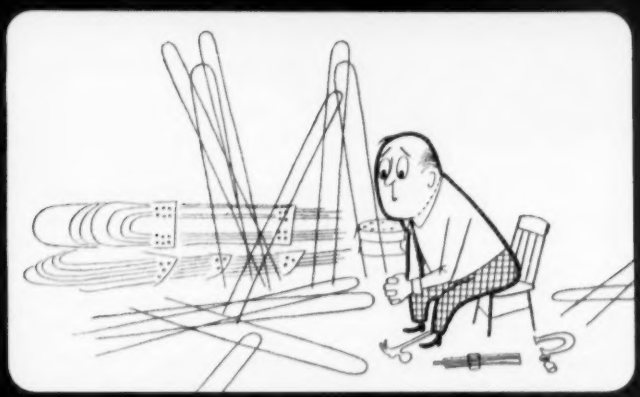
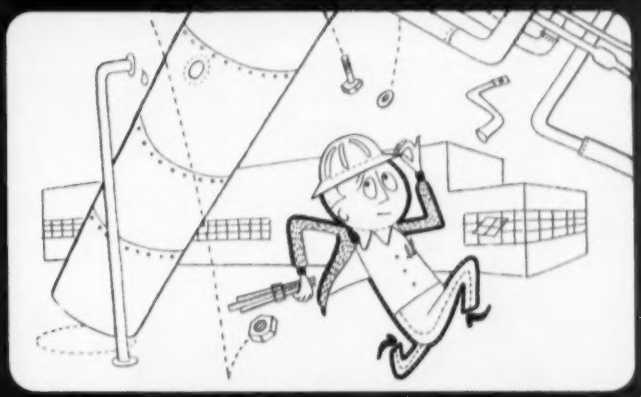


PLANNING A NEW UNIT – OR A COMPLETE PLANT, MILL OR REFINERY?

PROBLEMS OF DESIGN AND CONSTRUCTION ARE PILING UP



SURE YOU HAVE GOOD ENGINEERS – BUT NOW THEY MUST COPE WITH UNFAMILIAR PROBLEMS



AND YOUR STAFF JUST ISN'T BIG ENOUGH

WHY NOT CALL IN LUMMUS, WITH ITS ARMY OF EXPERT ENGINEERS?

YOU'LL GET JUST THE JOB YOU WANT AT MINIMUM CAPITAL INVESTMENT

The cartoon, of course, states the situation in very simple terms. But the basic truth is there. Building a new chemical installation, paper mill, petroleum refinery or power plant is more than a "do-it-yourself" project. Lummus has built over 700 plants throughout the world. When you are ready to build your next plant, you can call in thousands of trained men – without adding to your payroll – by calling in Lummus. And remember, your process "secret" is safe with half-century-old Lummus.

THE LUMMUS COMPANY
385 Madison Avenue, New York 17, N. Y.

LUMMUS

ENGINEERS AND CONSTRUCTORS FOR INDUSTRY

NEW YORK · CHICAGO · HOUSTON · THE HAGUE · LONDON · MONTREAL · PARIS

OLD soils need NEW life!

revitalize them with - THE IRON CHELATE

PERMA GREEN IRON 135

for BIGGER, BETTER and FASTER-GROWING CROPS

UNTREATED

TREATED

ORANGES

Four ounces to one pound PERMA GREEN IRON 135 per tree produces dark green leaves and more, larger and better colored oranges.

When iron is lacking and plant leaves turn yellow, PERMA GREEN IRON 135 makes them dark green in two weeks' time.

PERMA GREEN IRON 135 *now produces* –

– healthier and more productive blueberry bushes
– larger and more beautiful roses
– deeper-green leaves on azaleas and rhododendrons
– more attractive ornamental trees and shrubs.
– more nutritious vegetables
– more and juicier oranges and grapefruit
– more and larger nuts

Write for detailed information on PERMA GREEN IRON 135 for plants and reprint of scientific article on CHELATES.

Developed by RESEARCH • Proved by PERFORMANCE

for quality products, remember –

Refined PRODUCTS CORPORATION

Manufacturing Chemists • 632 Schuyler Ave. • Lyndhurst, N. J.

SUNFLOWERS

Grown in nutrient solution. Small yellow plant at left treated with iron sulphate.

Large dark green plant at right treated with PERMA GREEN IRON 135.

GARDENIAS (Greenhouse)

Iron is very important for gardenias. Treat each bush with 1/16 to 1/8 level tablespoonful PERMA GREEN IRON 135 to insure dark green leaves and large pure white flowers.

V-C Develops New TVA Granulator

by H. E. Gallison, *Manager*
Industrial and Portable Mixer Section
Worthington Corporation,
Plainfield, N. J.

A basic design obtained from Virginia-Carolina Chemical Corporation's Engineering Department—the result of V-C's extensive experimentation in the field of granular fertilizer production—has added a new continuous ammoniator-granulator to Worthington Corporation's line of fertilizer mixers.

Worthington has furnished four of these ammoniator-granulators for Virginia-Carolina at their newest fertilizer plants: Estherville, Iowa; Remington, Indiana; Orrville, Ohio and Fort Wayne, Indiana.

The machine is a modified TVA ammoniation unit which has reduced power consumption and space of installation and has increased the rate of granulation. Whereas the TVA granulating system employs one drum for ammoniation and a second drum for granulation and conditioning of the granules, the V-C principle combines the two operations in one unit.

This new combination ammoniator-granulator consists of a 7-foot diameter by 14-foot long carbon steel cylinder or drum mounted on trunnions and powered by a 15 HP motor through a ring gear and pinion with gear reducer and Worthington multi-V-belt drive. The standard rotation of the drum is 8 RPM which may be varied by changing V-belts and sheaves. The usual method of installation as shown in Figure 1 provides a foundation giving a slope of 10" in 14' to the axis of drum rotation.

The drum is divided into two compartments. The first, the ammoniating compartment, is 8' long. Unmixed dry components are fed into the ammoniating compartment at a definite weight per minute. The automatic weighing and feeding equipment can be seen in the right foreground of figure 1. A heavy steel fabricated beam supported on a steel frame work at each end of the main frame carries the solution piping, the TVA distributing manifolds and the scraper blade for the ammoniating compartment. Figure 2 and Figure 3 show the solution pipes flexibly connected at the discharge end of the machine where the control valves are located. In the ammoniating compartment sulphuric acid, nitrogen solution, anhydrous ammonia and phosphoric acid are added deep in the bed through the TVA solution distributors in any combination or quantity and are thoroughly mixed with the dry material.

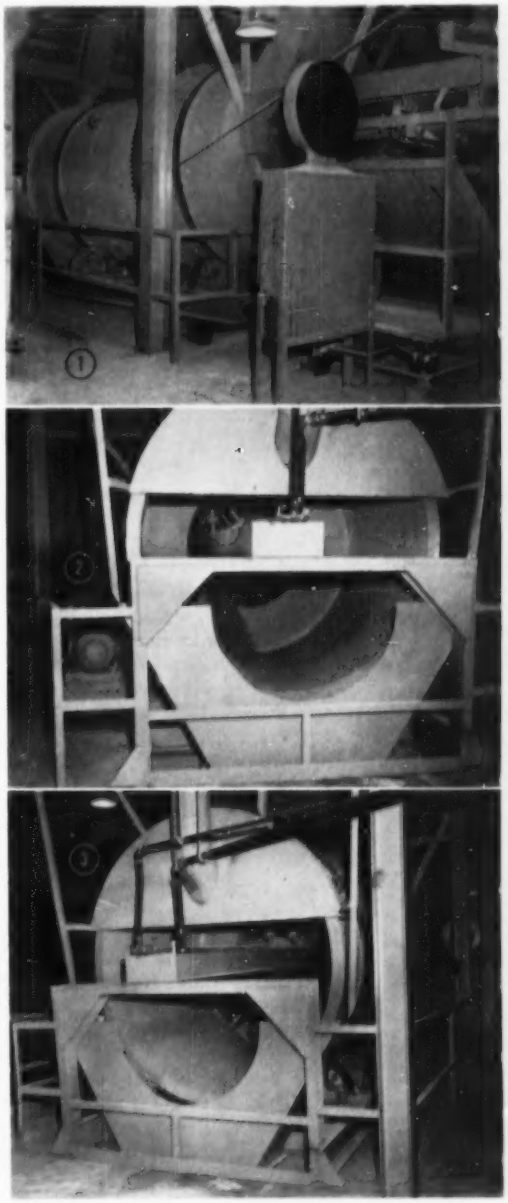
Fumes and water vapor produced by the heat of reaction are drawn out by an exhaust fan through the fume removal hood shown in Figures 2 and 3. The partition or bulkhead that forms the two compartments in the drum as seen in Figures 2 and 3 has an opening 48" in diameter in the center and one small rectangular opening next to the drum shell. The blended material overflows this bulkhead so that a bed of material approximately 20" deep is maintained in the ammoniating compartment. The overflow drops into the granulating compartment which is 6'-0" in length and here the granules are formed and conditioned as the material moves toward discharge from the open end of the drum. The small rectangular opening in the bulkhead next to the drum shell provides a cleanout by permitting the residual material in the ammoniating compartment to escape after the automatic feeding has been shut off.

Material flows through the drum at a rate of 4 feet per minute, giving a retention time of from 1-½ to 2 minutes in the ammoniating compartment and 1 to 1-½ minutes in the granulating compartment. The approximate time required for passage through the entire equipment is from 2-½ to 3-½ minutes, depending upon the flow characteristics of the fertilizer grade being granulated.

It has been found that this unit will receive 20 tons of basic feed per hour, including dry and wet components. This is in addition to re-circulating fines up to 50 or 60 per cent of the original feed, making a total out put of 32 tons per hour.

F. C. Richter who is in charge of Virginia-Carolina's engineering reports that "there has never been any evidence of choking up or mudding, provided the operator is observant and controls his admix of liquid components." He says that "very good success has been had with all grades and the rate of granulation is very high."

The new continuous ammoniator-granulator is being manufactured from standardized parts at Worthington's Plainfield, N. J. works where their other line of drum-type mixers are produced.



ABRASION and SHATTER TESTS for GRANULAR FERTILIZERS

by
DONALD E. GARRETT and CHEN Y. LEE
American Potash & Chemical Corporation

In the development of a new granular fertilizer, or in the quality control of an existing granular process, the abrasion resistance and shatterability of the product must be known. This can generally be determined visually in a qualitative way, but if advantage is to be taken of the best features of a granular product (its free-flowing, non-caking, and non-dusting characteristics) a quantitative measure should be available. The American Potash & Chemical Corporation was faced with this problem several years ago, and has considered many methods for such quality control. The method finally adopted, "screening" with steel balls, is perhaps the simplest, yet it combines the virtues of reproducibility, speed, and a simulated "materials handling" abrasion better than did any other procedure tried. Assuming that others in the industry have had need for a similar test, its development is reported here.

Previous Work

Many types of abrasion or shatterability test have been reported, but few combine simplicity with reproducibility and adaptability to several products. Single particle tests have often been used, such as that of Hardesty and Ross.[1] Their test employed a rack and pinion device similar to that used in elevating the barrel of a microscope, mounted directly over an anvil resting on the platform of a spring scale. A single granule was placed on the anvil under the rack, and pressure was applied by lowering the rack until the granule broke. An indicator recorded the maximum stress required to crush the granule. This method is only reproducible when the average of many samples is taken, for the strength varies with the size and shape of the granule, and with the angle of testing. It also does not give a direct answer on the degradation to be expected in the bulk handling of the fertilizer. Because of these factors its usefulness is rather limited.

A second type of measurement commonly used is the tumbling test. ASTM method D294-50[2] for testing the abrasion resistance of coke is typical. It uses a 36-inch diameter by 18-inch long steel drum which rotates 22 pounds of sized coke for 1400 revolutions (at 24 rpm). The results are reported as a screen analysis of the final product, the portion retained on an intermediate screen being termed the 'stability factor," and that retained on the

TABLE 1. Screen Analysis of Commercial Granulated Fertilizers Tested

Fertilizer Product	Mesh					
	+10	10 to 20	20 to 28	28 to 35	—35	Total
1. Triple Superphosphate, G	14.5	24.7	13.0	12.3	35.5	100.0
2. Triple Superphosphate, G	24.3	33.1	17.5	10.8	14.3	100.0
3. Superphosphate, P	50.1	25.5	4.8	2.8	16.8	100.0
4. 10-10-10, P	45.9	37.9	7.2	4.4	4.6	100.0
5. 10-10-10, G	75.6	24.0	0.4	0.0	0.0	100.0
6. 10-8-4, G	58.6	29.4	4.4	1.8	5.8	100.0
7. 11-8-4, G	83.4	16.5	0.0	0.0	0.1	100.0
8. 16-20-0, G	45.9	47.6	4.9	1.2	0.4	100.0
9. 16-20-0, G	72.7	25.8	0.9	0.4	0.2	100.0
10. KCl, 1	48.6	48.2	2.5	0.1	0.6	100.0
11. KCl, 2	66.1	32.1	1.0	0.2	0.6	100.0

P = Pellets G = Granulated

TABLE 2. Development of Tests

A. Screening Test (8" screen, 10-mesh; sample placed under the balls)

1. KCl*

	Mesh					
	+10	10-20	20-28	28-35	-35	-10
60 Min. W/O Balls	73.6	25.0	0.06	0.10	1.24	26.4
30 Min. 300 3/16" Balls	70.3	28.0	0.2	0.2	1.3	29.7
30 Min. 500 3/16" Balls (1)	60.0	36.5	0.6	0.3	2.6	40.0
500 3/16" Balls (2)	65.1	30.8	0.6	0.3	3.2	34.9
Avg.						37.4
60 Min. 500 3/16" Balls (1)	55.6	38.7	0.7	0.4	4.6	44.4
500 3/16" Balls (2)	54.3	39.1	1.2	0.5	4.9	45.7
Avg.						45.1

2. 10-10-10 (5)

60 Min. W/O Steel Balls	93.2	6.6	...	...	0.2	6.8
60 Min. 500 3/16" Balls (1)	90.8	8.0	...	...	0.3	9.2
500 3/16" Balls (2)	91.2	8.5	...	...	0.3	8.8
Avg.						9.0

3. 10-8-4 (6)

60 Min., 500 3/16" Steel Balls						
Balls on Sample	79.8	12.3	0.9	1.4	5.6	20.2
Sample on Balls	78.5	15.0	0.8	1.2	4.5	21.5

B. Impact Test (95 to 100 psig Air, 100°F, 28 SCF/Min. at 14.7 psig and 70°F = 300 ft./sec.)

1. KCl*

	+10	10-20	20-28	28-35	-35	-10
1.	23.7	40.5	8.7	5.0	22.1	76.3
2.	28.2	33.5	7.2	5.2	25.9	71.8
Avg.						74.1

2. KCl*

Rapid addition (50 g in 15 min.) (1)	79.0	15.3	1.9	1.0	2.8	21.0
Rapid addition (50 g in 15 min.) (2)	83.4	11.0	1.8	1.0	2.8	16.6
Rapid addition (50 g in 15 min.) (3)	80.2	14.1	2.0	1.0	2.7	19.8
Rapid addition (50 g in 15 min.) (Avg.)						19.1
Medium addition (50 g in 30 min.)	73.2	17.9	2.8	1.8	4.3	26.8
Slow addition (50 g in 120 min.)	63.8	25.2	3.7	2.4	4.9	36.2

*Special batch.

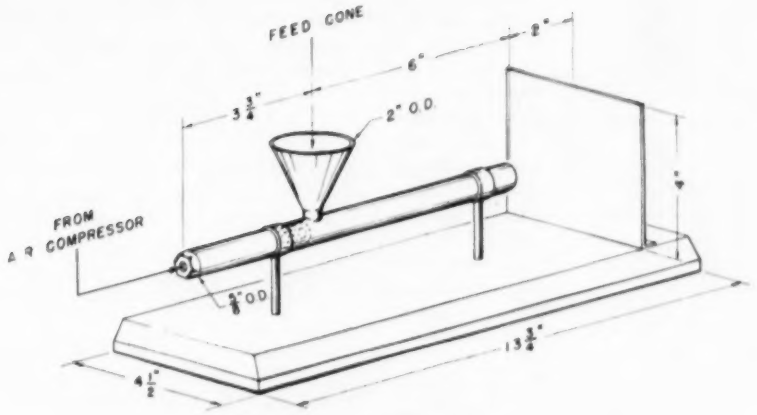


Figure 1. Impact Tester
Shatterability Test for Granular Fertilizers

smallest screen, the "hardness factor." A similar test for fertilizers by Ross, et al.[3] tumbled 8-to 14-mesh granules in a 16-ounce bottle for 48 hours. The minus 14-mesh material was reported. Both tests are characteristic of this method in requiring special equipment and extra time. The results are quite pertinent and reproducible, but such gentle handling works well only on soft, brittle, or very angular materials.

A third testing method involves the use of impact devices. The "drop shatter" test for coke, ASTM D141-48[4], is an example. Here a charge of 50 pounds of sized coke is dropped four times from a six foot height onto a steel plate. A report is made of the terminal screen analysis. A second impact device has been reported by Miller and Saeman[5]. A sample of 8-to-10-mesh particle is fed into a stream of air discharging through a horizontal tube 0.5 inches in diameter and six inches long. The sample impinges at a calculated velocity of 500 feet per second against a steel plate perpendicular to the path of flow and placed one to three inches from the tube discharge. The results are determined by screen analysis of the shattered sample. These tests determine principally the impact strength rather than abrasion resistance, and so do not simulate very closely the action encountered in processing and handling equipment. However, the method is fast and simple.

Test Methods

In evaluating the above methods, and in developing new ones, it was necessary to consider the special characteristics of the American Potash & Chemical Corporation's product, Agra, agricultural grade pelletized potassium chloride. Pellets are formed by subjecting potash to very high pressures so that a "crystal flow" takes place, and a hard, dense pellet is produced. These pellets are about 1 inch in diameter, and are crushed and closely sized to the desired 6-to 30-mesh product.

Because of the large size of the original pellet a single-particle crushing test could be considered, and for a period this method of quality control was tried. In general, good results were obtained, but a statistical analysis of a large number of results was required to accurately evaluate the hardness, so the method was comparatively slow. Furthermore, it did not give a direct indication of the product's handling characteristics.

In an effort to improve upon these results two additional methods were tested: one, the impact device of Miller and Saeman, and two, a simple screening method. Figure 1 is a sketch of the impact tester. One end of the apparatus was connected to a portable air compressor supplying air at a maximum pressure of 100 psig. A measurement of the air flow with a Fischer-Porter rotameter indicated an average discharge velocity of around 300 feet per second. While the air supply was on, pelletized potassium chloride of 6- to 10-mesh size was fed through the feed cone into the horizontal tube, where it impinged against the steel plate and was collected in a polyethylene bag. A screen analysis was made of the shattered product.

In the second device, the screen tester, a sample of 250 grams of 6- to 10-mesh size pelletized potassium chloride was put into a 10-mesh, 8-inch screen together with five hundred 3/16-inch steel balls. The mixture was shaken with a screen vibrator for 60 minutes. A screen analysis was made of the shattered granules, and the shatterability was found by the amount of fines produced.

In order to more fully evaluate these methods tests were run on a number of granular fertilizers as well as on potash. A screen analysis of the materials as purchased is given in Table I. These materials were then screened to give samples of 6- to 10-mesh size, and were subjected to the impact and screening tests. Typical results are given in Tables II and III. Table II shows the effectiveness of the balls in speeding the degradation, and of the increased abrasion with time. It also points out the rather interesting fact that the placement of the balls either on top of the sam-

TABLE 3. Comparison of Abrasion (screening) And Shatterability (impact) Tests

Feed: 6-to-10 mesh granules. Numbers refer to products listed in Table I.

Sample		Screening Test, wt. %		Impact Test, wt. %	
No.	Type	-10-mesh	-35-mesh	-10-mesh	-35-mesh
5	10-10-10, G	4.0	0.2	2.2	0.2
3	Superphosphate, P	5.7	1.0	2.6	0.3
2	Triple superphosphate, G	5.7	2.5	4.3	0.5
4	10-10-10, P	6.9	0.8	3.8	0.5
9	16-20-0, G	7.8	0.5	4.2	0.3
11	KCl, 2	9.3	1.0	17.7	1.3
7	11-8-4, G	10.1	0.6	5.9	0.5
8	16-20-0, G	12.2	0.7	2.5	0.3
6	10-8-4, G	24.3	5.0	9.3	1.0
10	KCl, 1	25.3	3.3	19.2	2.8
1	Triple superphosphate, G	32.7	9.4	6.2	0.9
5	10-10-10, G	4.0	0.2	2.2	0.2
8	16-20-0, G	12.2	0.7	2.5	0.3
3	Super phosphate, P	5.7	1.0	2.6	0.3
4	10-10-10, P	6.9	0.8	3.8	0.5
9	16-20-0, G	7.8	0.5	4.2	0.3
2	Triple superphosphate, G	5.7	2.5	4.3	0.5
7	11-8-4, G	10.1	0.6	5.9	0.5
1	Triple superphosphate, G	32.7	9.4	6.2	0.9
6	10-8-4, G	24.3	5.0	9.3	1.0
11	KCl, 2	9.3	1.0	17.7	1.3
10	KCl, 1	25.3	3.3	19.2	2.8

ple, or below the sample has very little effect upon the results. The results of the impact test are seen to be somewhat less reproducible, and quite sensitive to the rate of addition of the granules into the air stream.

Table III summarizes the results of the individual determinations, and compares the two test methods. It is shown that the impact test rates the materials roughly in order of the fertilizer's brittleness (high breakage for the potash samples), with a secondary dependence upon the material's hardness (medium breakage for the superphosphates). The sequence of -35-mesh values followed by exactly the -10-mesh fraction, irrespective of smoothness or angularity of the product. This indicates that impact alone was the controlling method of breakage.

For the screening test it can be seen that hardness first, and then brittleness and angularity, controlled the -10-mesh fraction, but that hardness was the most important factor for the -35-mesh fraction. These results indicate that the screening method most nearly resembles the action encountered by the material in handling. This, together with the better reproducibility and greater simplicity of the method, appears to make it the more practicable of the two tests. It involves inexpensive equipment and is comparatively rapid. From the experience of the American Potash & Chemical Corporation it is the simplest, least time consuming yet highly satisfactory abrasion and shatterability test method that has been developed.

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2. *American Society for Testing Materials, ASTM D294-50, Adopted, 1929; Revised, 1950, "Tumbler Test for Coke."*

3. *Ross, W. H., Yee, J. Y., and Hendricks, S. B., Ind. Eng. Chem. 37 1079-83 (1945).*

4. *American Society for Testing Materials, ASTM D141-48, Adopted, 1923; Revised, 1948, "Drop Shatter Test for Coke."*

5. *Miller, P., and Saeman, W. C., Ind. Eng. Chem. 40 159 (1948).*

RESEARCH RESULTS & REPORTS

Blue grass thrives best on small, regular doses of fertilizer throughout the Summer, rather than one big feeding in the Spring, according to the paper presented at the American Chemical Society fertilizer division by Dr. Frank A. Gilbert, of Battelle Memorial Institute. Lawns fertilized only in the Spring lack the food they need in the July and August heat period. Conclusion —fertilize in Spring and mid-Summer, rather than in early Fall.

O

Insoluble forms of zinc and copper fertilizer can still do a good job, according to the University of Wisconsin because even the most completely insoluble forms send out a few ions in solution, and in that form the plants can use these metals. M. L. Jackson and L. E. DeMumbrum did the research.

O

Reverse 2,4-D—which spares the broad-leaf plants—was reported at the ACS meeting by a Monsanto man, Dr. P. C. Hamm. Not entirely ready to put on the market, but an interesting development for lawns, though not for broad-leaf crops.

O

Testing soils via soil sample bags is a technique being used at Ohio State. The farmer gets his bags from the dealer, sends them to the college, and the test is made without having to travel men, or taking up the time of the county agent. But when the report comes back it goes not only to the farmer, but to the county agent and the dealer as well so they can help.

O

Woody plants and how to control them chemically is a new report published by the Division of Agricultural Sciences, University of California. It is a 40-page pamphlet, known as Bulletin 755. Just write to California AES, Cal. for a copy.

O

$7,500 has been granted to the University of Missouri by Olin Mathieson to support basic research entitled "A Study in Energetics of Ionic Relationships in Soils and Plants."

O

Root rot hits harder at plants deficient in iron, nitrogen, phosphorus, sulphur, calcium and magnesium, according to the University of Minnesota.

O

Deep placement of fertilizer and lime—really deep—15 to 24 inches is being tried by West Virginia University AES, to see what influence it will have on yields and longevity of the stands.

O

Irrigation results on a 12-acre test with vegetables grown for processing are reported in a bulletin just put out by New York's AES at Cornell.

O

Fertility is essential if moisture is to do crops any good, USDA reports. When soil fertility is low, growers can't get much increase in cotton from extra irrigation. But if the fertility is increased, increased irrigation will produce increased yield, roughly proportional to the amount of water applied.

O

Fired corn may be due to lack of nitrogen, rather than excessive heat, says George Lippincott of **Dorchester Fertilizer Co.** When the corn was heavy with ears and the moisture was short, corn with plenty of N did not fire like those with an N deficiency.

CFA Handbook In Second Edition

The Western Fertilizer Handbook, a publication of The Soil Improvement Committee of the California Fertilizer Association, continues in strong public demand, according to the committee. The Handbook is now in its second edition. More than 22,000 copies have been distributed since its first appearance in September 1953. Earle J. Shaw, Chairman of the Handbook subcommittee, reports that many orders are received each day from various portions of the civilized world, and he expressed gratification for its reception by the public.

It can be purchased in single or multiple copy orders through the California Fertilizer Association, 475 Huntington Drive, San Marino 9, Calif. All orders must be accompanied by remittances to cover them in full. The price is $1.00 per copy, including tax and mailing charges.

Southern Control Officials Plan June 17-19 Meeting

The fifteenth annual convention of the Association of Southern Feed and Fertilizer Control Officials will be held June 17-19 in Birmingham, Ala., at the Dinkler-Tutwiler Hotel, according to word from Bruce Poundstone, secretary-treasurer of the Association.

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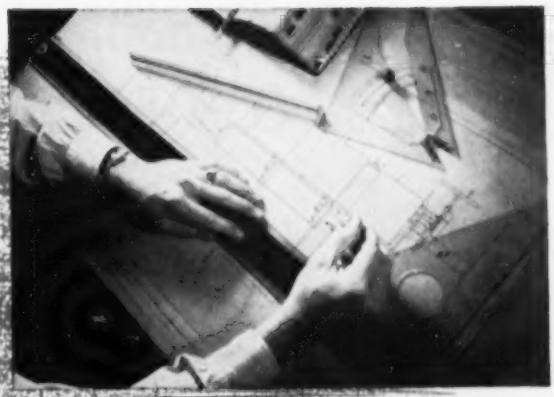

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NPK TERMINOLOGY UP AGAIN AS CONTROL OFFICIALS MEET

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There is a desire on the part of agronomists, horticulturists and others to recommend expression of fertilizer analyses and guarantees in terms of the elements. Present fertilizer laws require phosphorus and potassium to be expressed as the oxides. The recommended change makes it possible for guaranteeing phosphorus and potassium as the elements. This is thinking ahead and makes provision for guarantees in terms of the elements without further change in the law.

Both Horticulturists and Agronomists were 3-1 in favor of the change. Replies were received from 40 States and one Territory; answers came from 42 Extension Horticulturists and 82 Extension Agronomists. A higher proportion favoring no change came from the Northeastern and Southern States. However, in these areas, the ratio was 2-1 in favor of the change. The North Central States favored the change 6-1 and the West 6-1.

With respect to the least amount of time it would take in the States to make the change, the range was from none up to 10 years, with an average of 3 years. Their opinion as to number of years it would be advisable to have both methods of labeling on the bags was from 0-10 years. The average was 4 years. Most of the replies indicated that both forms of labeling should appear on the fertilizer bags for 2-5 years before making a complete change to N-P-K.

THE RESOLUTION

Whereas, the proposal to change the fertilizer guarantees from an oxide basis for phosphorus and potassium to the elemental basis has received approval by most professional groups concerned; and Whereas, the National Association of Commissioners, Directors and Secretaries of Agriculture has requested this association to prepare a proposal for its consideration.

Therefore be it resolved that the Association of American Fertilizer Control Officials recommends to the respective states that it is essential to American Agriculture for each state law to be amended to permit by July 1, 1960 such change on a gradual but uniform basis as provided in the model state fertilizer bill. Be it further resolved that a copy of this resolution be sent to: (1) The National Association of Commissioners, Directors and Secretaries of Agriculture and each of its members; (2) The Soil Science Society of America; (3) The Experiment Station Committee on Organization and Policy; (4) The extension Service Committee on Agriculture and policy.

The change as covered in the Proposed Model State Fertilizer Bill (Eleventh Draft, October, 1956) is as follows:

"(f) Guaranteed Analysis: (1) Until July 1, 1960, and thereafter until the ..... prescribes the alternative form of "guaranteed analysis" in accordance with the provisions of sub-paragraph (2) hereof, the term "guaranteed analysis" shall mean the minimum percentage of plant nutrients claimed in the following order and form:

Total Nitrogen (N) . . . .per cent
Available Phosphoric Acid (P_2O_5) . . . .per cent
Soluble Potash (K_2O) . . . .per cent

(2) At any time after July 1, 1960, that the ..... finds, after public hearing following due notice, that the requirement for expressing the guaranteed analysis of phosphorus and potassium in expressing the guaranteed analysis of phosphorus and potassium in elemental form would not impose an economic hardship on distributors and users of fertilizer by reason of conflicting labeling requirements among the states, he may require by regulation thereafter the "guaranteed analysis" shall be in the following form:

Total Nitrogen (N) . . ..per cent
Available Phosphorus (P) . . . .per cent
Soluble Potassium (K) . . . .per cent

provided, however, that the effective date of said regulation shall be not less than six months following the issuance thereof, and provided, further, that for a period of two years following the effective date of said regulation, the equivalent of phosphorus and potassium may also be shown in the form of phosphoric acid and potash; provided, however, that after the effective date of a regulation issued under the provisions of this section, requiring that phosphorus and potassium be shown in the elemental form, the guaranteed analysis for nitrogen, phosphorus, and potassium shall constitute the grade."

AGAINST

by W. F. Price
Swift & Company
Plant Food Division

Reducing The Oxides

When Dr. Etheredge invited me to participate in this program he left the choice of a subject strictly up to me. In casting about for a topic of mutual interest, it occurred to me that I might as well go all out and express my viewpoint on the controversial subject of the elemental vs. oxides in plant food guarantees. Many of my associates upon learning of this intention, considered it a foolhardy undertaking and hastened to caution me that "wisdom is the better part of valor." They suggested I tackle a less controversial topic. But, in this case I decided to substitute courage for wisdom because I have a deep conviction that all angles of this important proposition have not been thoroughly considered.

Since the choice of subject was entirely mine, let me emphasize the views are **also** my own. On a topic of such paramount importance I would not presume to speak for all of the plant food industry. Neither am I naive enough to believe that what I say today will be the final word on the subject. Nevertheless, I hope that I can contribute some thoughts that will help all parties to bring the proposition into sharper focus.

Admittedly, it would be much easier for me to stand before you and join with others in telling you why the oxides should be reduced.

Talk at American Fertilizer Control Officials' Annual Meeting Shoreham Hotel, Washington, D. C., October 19, 1956.

1—Russell W. Ludwick, New Mexico, immediate past president, presents plaque to retiring AAFCO president, M. P. Etheredge.
2—AAFCO Executive Committee: Seated—vice president, Joe Taylor, Tallahassee, Fla.; president, J. D. Patterson, Salem, Oreg.; sec'y-treas., Bruce Cloaninger, Clemson, S. C. Standing —F. W. Quackenbush, Lafayette, Ind.; Charles V. Marshall, Canada; Stacy Randle, New Brunswick, N. J.; E. A. Epps, Jr., Baton Rouge, La.; M. P. Etheredge, State College, Miss.
3—Hugo Riemer, Nitrogen Division, Allied Chemical & Dye, New York; Russell Coleman, NPFI, Washington, D. C.
4—W. H. McIntyre, a past president AAFCO; W. F. Price, Swift and Co.; Bruce Cloaninger, Clemson, S. C.
5—J. J. Taylor, Tallahassee, Fla.; K. D. Jacob, USDA, Beltsville, Md.
6—R. F. Poole, Clemson, S. C.; Paul Truitt, NPFI, Washington, D. C.
7—J. D. Patterson, Salem, Ore.
8—F. W. Quackenbush, Lafayette, Ind.; Paul Sanders, The Southern Planter, Richmond, Va.; M. P. Etheredge, State College, Miss.

If I should fail to counsel with you on some of the less thoroughly discussed problems involved in making this change, however, I would not only be untrue to myself but I would do a grave injustice to so many of my friends and competitors in the fertilizer industry, who vigorously oppose this change.

Everything must have a beginning—someone must motivate and cultivate an idea to start it on its road to life. I wouldn't know just who should be handed first credit on the "elemental" idea. I recognize that this proposal has been "kicked around" in this country for at least thirty years and that the change has actually been made in at least one European country (Norway) whose fertilizer practices are entirely different from ours. It is my understanding that another European country (Sweden) attempted to make the change fifteen years ago. I say **attempted** because I understand that it is still necessary to use both the oxides and the elements in expressing fertilizer guarantees.

I would be the first to admit that phosphorus and potassium should have been expressed in the elemental form when the plant food nutrients first sought expression over a hundred years ago. The question which has to be answered today is not whether this historical change can be made, **certainly it can,** but is there sufficient unanimity among **all** the groups affected so that the change can be made without causing a chaotic condition?

Like any historical event, this matter of changing plant food guarantees to the elemental basis would not necessarily affect all concerned with equal benefit. You and I both have seen the list of pros and cons, and I am not going into a recita-

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tion of them here. It would be your job, as control officials, to administer and enforce the provisions of this proposal should it become law. Our concern, then, in reaching a decision as to whether or not this measure merits your support is in determining how great the benefits will be—**and to whom. Yes to whom?**

"To whom" is so important it will pay to take a fast look at "what" started the present elemental ball rolling. Back in 1951, at a meeting of the agronomy heads from colleges in the North Central states, the soil scientists drafted a resolution recommending the discontinuance of the practice of expressing phosphorus and potassium contents of fertilizers in terms of the oxides. They then directed the resolution to all national, regional, and state agencies everywhere who had anything to do with fertilizers.

Admittedly, in agronomic research and teaching, as well as in fertilizer control calculations and nomenclature, an elemental basis for plant food guarantees would, of course, simplify terminology and make the work of the **scientists** easier in that respect. In the interpretation of soil analytical data, they no longer would have to multiply by 2.29 or 1.20 to change P and K determinations to P_2O_5 and K_2O. To be sure, there are other advantages which undoubtedly had a bearing on their recommendation. But in the list of "pros and cons" presented to the Soil Science of America and the American Society of Agronomy by their Fertilizer Committee, there are **just three** advantages listed: 1. Uniformity of terminology 2. Simplicity of expression 3. Accuracy.

A good salesman knows the value of parading "appeals" in his presentation. I've always said a good agronomist must be a good salesman. He has to be to sell the product of his effort. Thus those three simple advantages — Uniformity, Simplicity, Accuracy,— become important appeals that elicit favorable response. And why not? Any agronomist worthy of his name wants the benefit in his daily work of uniformity, simplicity, and accuracy.

And so on the strength of Uniformity, Simplicity, Accuracy, the American Society of Agronomy in 1955 by a margin of 18 to 1 voted to endorse the change-over, and since then endorsement has been received from the Soil and Fertilizer Research Committees, Experiment Station Policy Committee, and the Southern Fertilizer Control Officials.

According to my understanding, only a small percentage of the groups contacted with the original resolution have as yet endorsed this proposal. Naturally, I am not familiar with the survey results. Mr. Enfield will report upon this, this afternoon, but I point out they come from scientific groups. Endorsements from scientists or administrators, while extremely important, are still from groups who do not have to grapple with the problem at the grass roots. What about the reaction of the National Association of County Agents, the vocational agriculture teachers and, yes, the farmers themselves? I understand that the leaders of the Farm Bureau, The Grange, and other national farmer organizations have been contacted. Has an expression of the feeling of these groups been obtained?

In my contacts, I find that notwithstanding the recent publicity, many members of the fertilizer industry do not know that this change is being **seriously** considered. Of those who have heard of this proposal, I am convinced that a vast majority of them are opposed to the change. My belief is substantiated by a number of informal industry surveys made in the past on this subject. To what extent industry members in each state will actively oppose this change I am not sure. It may be that such a vast majority of the agricultural leaders are favorable to it that industry in most states will acquiesce without serious opposition. The principal theme of my discussion to you is—**be sure before** making the move that there is **enough** support in each state to get the necessary laws changed. My appeal and primary reason for discussing this subject with you is to avoid what might occur if some states made the change and others did not. Suppose, for example, that the states of North Carolina and Georgia made the change but that opposition in South Carolina was strong enough to prevent making such a change. It is easy to visualize what a chaotic condition this would cause not only among members of our industry who operate across state lines but also among your group who enforce the law and statisticians who try to keep a record of fertilizer movement. Being sure that most of the states will go along is

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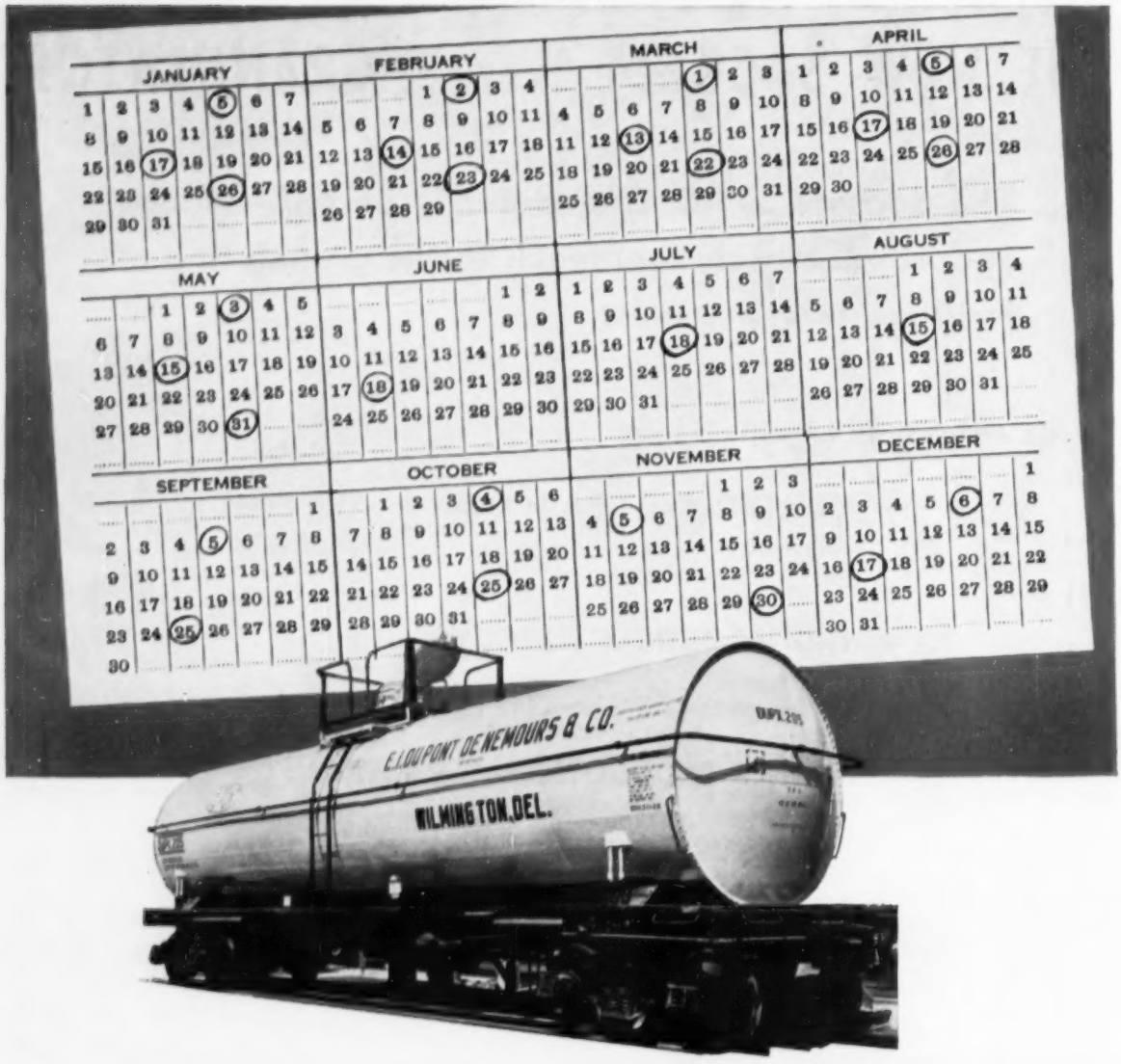

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not enough. Each control official must be sure that his state will definitely make this change at the target date. The alternative to this is chaos.

Therefore, we need more reaction from down on the farm. We need the reaction of the plant food dealer. Will the elemental change simplify his explanation of the experiment station recommendations to his customers and will it increase his business? Dealer education is a continuing problem for both the industry and the experiment stations. There are few fertilizer dealers as such. Rather they are feed dealers, tobacco warehousemen, farmers, or seedsmen who handle fertilizers as a sideline. By and large, their interest in the technical aspects of plant food is not great. Yet, many surveys have shown that the fertilizer dealer has a greater effect upon the farmer in his use of fertilizer than does any other group. The change-over would not necessarily mean **uniformity, simplicity** and **accuracy** in the dealer's attempts to **teach** the farmer how to better use the fertilizer with which he is already familiar. In my opinion, any move to complicate the dealer's business, however temporary the complication, would not gain his support in the legislature.

Today American agriculture is not without trouble. One of the principal ways in which the American farmer can be led out of his predicament is to follow the experiment station recommendations in reducing his cost of production. Fertilizer is one tool at the disposal of all farmers. At this time, more than ever before, every ounce of energy available among agricultural workers and among members of the fertilizer industry should be devoted toward "selling" better farm practices. Regardless of "how easy" it might be to make the change-over to the elemental basis, it will require a major educational effort on the part of those contacting the farmer. At this time, could not the efforts of our agricultural leadership accomplish more by directing it toward proper fertilizer use rather than toward an explanation of the elemental change?

Gentlemen, the more one considers the numbers of people potentially involved or affected by a change to the elemental basis, the longer the list grows, coming clear on down to the garden supply dealer and the suburban gardener. There are millions of these home gardeners and more coming along every day.

A GOOD SCOUTING FATHER

J. R. Archer, International Mineral's chief chemist at the Atlanta plant, was at the Association of American Control Officials meeting in Washington when he learned his son was to become an Eagle Scout. He flew back to Atlanta, just made the ceremony, flew back—and never missed a meeting. And was young Jim proud!

Now then, what of your own responsibility in seeing thru the changes in your respective state laws? According to the report of the Committee to Consider the Advisability of Changing Guarantees to the Elemental Basis, the report prepared by the Fertilizer Committee of the Soil Science Society was sent to each of you, and you were then polled as to your attitude on several questions involving this change. Only two states could change without legislation. And of the 41 states returning the questionnaire, 18 were not sufficiently enthusiastic to poll their own control group as to those favoring and those not favoring. Four states said that "all" persons in their group favored. One said "all" had no preference, and in the 18 states remaining, 41 people favored the idea, 27 opposed, and 10 had no preference. Certainly, **this is a far from enthusiastic response** to a proposal favored 18 to 1 among agronomists.

Experiment Station personnel, however, need not implement legislation nor administer it when it becomes law, and this, I believe, accounts for the disparity of response. Whenever laws are opened for change, vulnerability puts in an appearance because the opponents to change have their counterbalances in the form of riders or other legislation. This could result in adoption of new provisions of the fertilizer laws, which would cause hardship for the legitimate manufacturer, and by the same token it could also create new enforcement problems for you, or both.

Thus I earnestly hope that this group will not become crusaders until a more thorough study has been made, and **will wait** until all sources are heard from before taking any further action. There are too many important and vitally interested sources not yet even contacted. There may not be nearly the unanimity of opinion within your own organization that should prevail. Individual, uncoordinated legislative action can result only in chaos for the plant food industry and bedlam in inspection and control procedures.

Meanwhile, let us work together in truly constructive developments occasioned by the advances of the technology of our industry—for example, we have the problem of sampling methods and tolerance establishment under increasing granulation, to solve. We are also faced with analytical and quality control procedures. Then we have the troublesome problem of protection of manufacturer and consumer alike from the fly-by-nighters and miracle-workers.

The technological road ever lengthens on mutual problems. Together we can realize the progress which is indicated in all the tomorrows of our industry.

But—as for consideration of legislation to change the oxides to elements, let me borrow a phrase we will be hearing a lot of in just a couple of weeks—**"Let's wait until all the returns are in and make sure all the precincts are counted."**

RESUME OF CONTROL OFFICIALS MEET

In addition to presentation of recommendations on the change from oxide to elemental basis the Control Officials program covered an unusually broad field. A quick run down will give some of its highlights.

Dr. Russell Coleman, executive vice-president, **NPFI**, presented the Institute's color film "What's in the Bag." He pointed out that the fertilizer industry has a very large capital investment in relation to the industry's total sales of just over a billion dollars—a statement the film substantiated as it moved along telling the story of fertilizer manufacture from production of its base materials to finish bagged goods.

Dr. M. P. Etheredge's presidential address was an unusual and very interesting review of some of the nation's industries including these in the fertilizer industry: Allied Chemical & Dye, Olin Mathieson Chemical, W. R. Grace, American Cyanamid, Monsanto, International Minerals and Chemical, Virginia-Carolina Chemical, Du Pont, Epting Distributing Co., Jackson Fertilizer Co. In spite of all the grandeur about big business, it accounts for

little more than half of our industrial sales. In other words, it also takes the small companies to make up our total. Some of the big ones thrive because of their much smaller industrial customers—otherwise, they themselves would be small.

Dr. R. F. Poole, president of **Clemson,** stressed the function of the land grant colleges, the wonderful work they do, the need for more of the young people of the country to study agriculture and its sciences.

Dr. Paul Sanders, editor, **The Southern Planter,** was the luncheon speaker and spoke on agriculture's role in the American story.

In 1830 approximately 90% of people lived on farms; today only 13%. The capital requirement per worker in agriculture is greater than the average for industry; in fact, American agriculture is the biggest privately owned business in the world, nearly 5 million small, independent competitive businesses with $170 billion invested in land, buildings and equipment. Agriculture is today the last stronghold of the competitive free enterprise system as we have known it in America—the farmer is a business man and his success depends upon management skills. Dr. Sanders believes that our farm population should be kept strong to make a better country for everyone.

F. W. Quackenbush of **Purdue** discussed some of the problems of sampling commercial fertilizers. The biggest problems, he said, are in the sampling of dry products. We have not developed and proved a satisfactory method for sampling bulk fertilizer; especially bulk piles, and it is doubtful that anybody knows just how a bulk pile would be sampled to obtain a representative portion. In many cases dozens or perhaps hundreds of different lots are shipped from the same bulk pile. Inspectors regard each shipment as a separate lot when in reality many are derived from the same pile. Much work could be saved with a more systematic approach to the whole matter. Because of the importance of this problem NPFI's task force has put this at the top of their agenda.

See page 72 for additional Control Officials material.

FIELD & FURROW CLUB WINS ASA AWARD

The Agronomy Club of the University of Illinois, Urbana, known as the Field and Furrow Club, for the second consecutive year, was named winner of the American Society of Agronomy's National Achievement Award for the best student agronomy organization of its kind in the United States.

The award, consisting of a trophy and $100 was presented by Dr. Willard H. Garman, Chief Agronomist, National Plant Food Institute, to Wayne McDonald of Chester, Ill. The award, sponsored jointly by the Institute and the Society, was presented during the Society's annual meeting at the Netherlands-Plaza Hotel, in Cincinnati.

The Field and Furrow Club is composed of 75 active under-graduate students in agronomy and is one of 39 similar student organizations at leading agricultural colleges throughout the country. All are members of the student section of the American Society of Agronomy and meet annually with the parent organization.

Determination of the best club in the United States is made on the basis of accomplishments in the areas of education, general college activities, special fund raising projects, and others.

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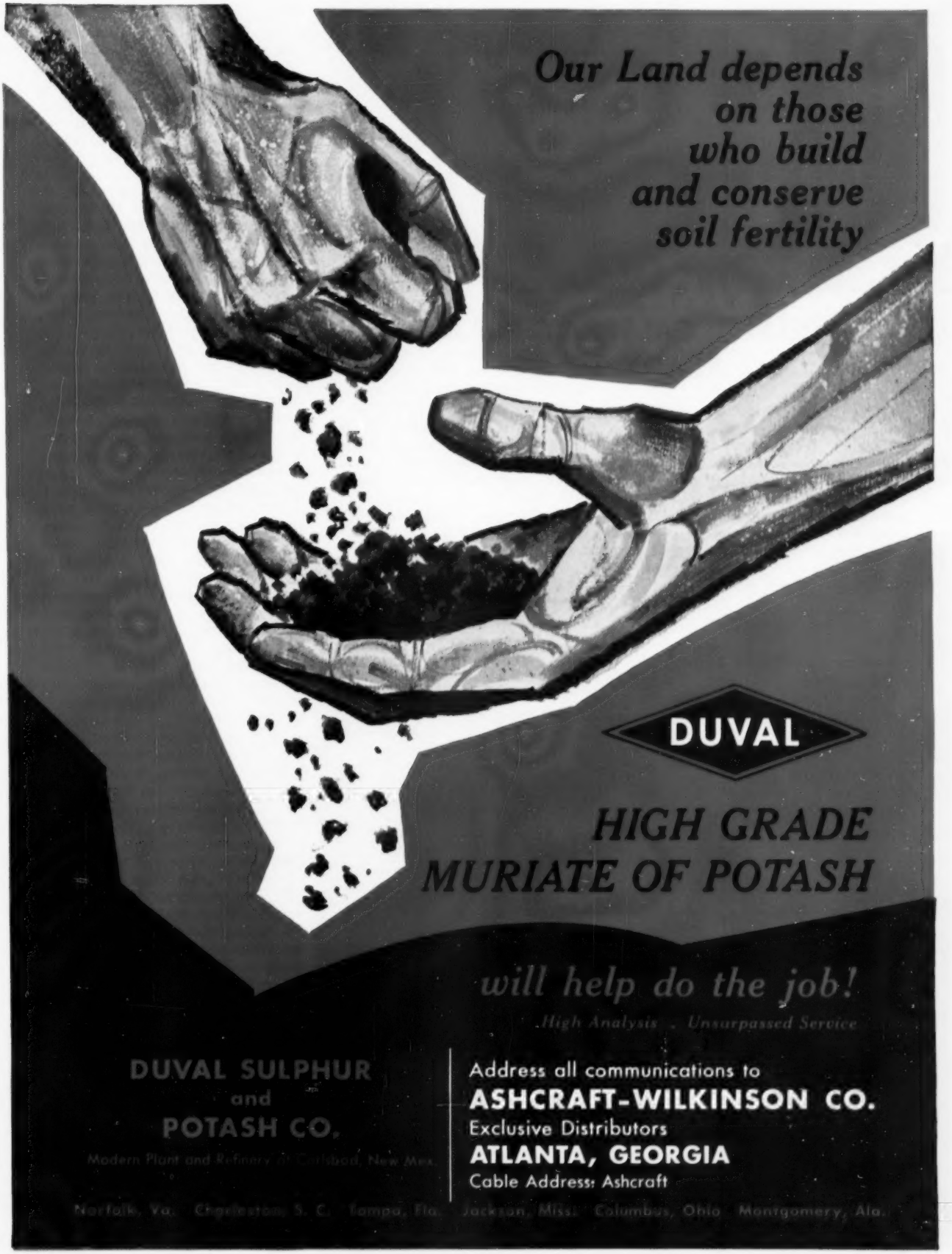
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who build
and conserve
soil fertility
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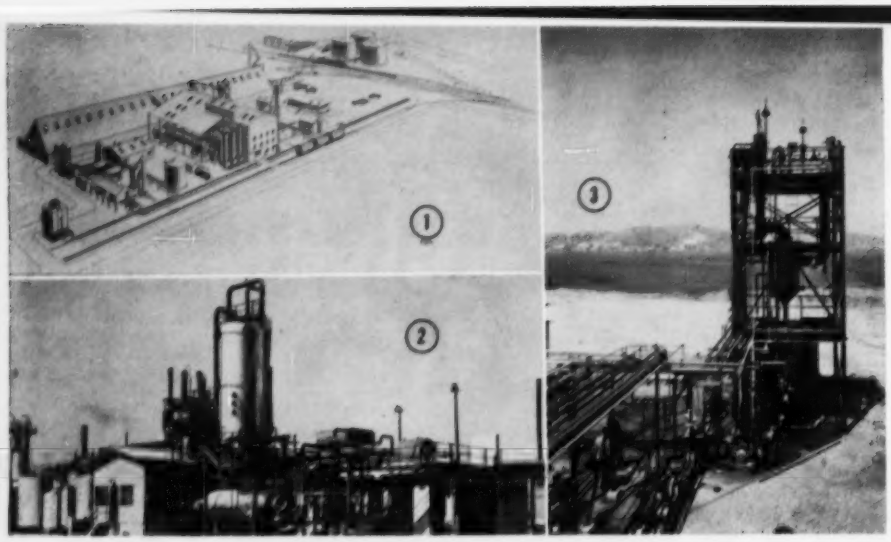

1. Drawing of Calspray's portion of $16,000,000 plant food plant series indicates relative positioning of various units pictured.
2. Nitric acid production plant at Standard Oil of California's Richmond refinery, which supplies acid needed for manufacture of pelleted plant foods at Calspray's nearby complex fertilizer plant.
3. Reactor and separator unit, heart of Stengel process which Calspray employs to manufacture ammonium nitrate solutions.
(Photos courtesy California Spray Chemical Corp.)

GIANT CALSPRAY PLANT READY TO GO

The multi-million dollar plant food project of California Spray-Chemical Corporation, on which we have reported frequently during the past year, is nearly ready to go on-stream at Richmond, California. The facility will be capable of producing 300 tons of complex pelleted plant food, 300 tons of liquid ammonium nitrate, 150 tons of ammonium sulphate, 200 tons of liquid calcium-ammonium nitrate, and 425 tons of aqua ammonia per day.

Manufacture of complex pelleted fertilizers at Calspray utilizes nitric acid as the acidulating agent to obtain available phosphoric acid from phosphate rock, which is a departure from the common practice in U.S. fertilizer production of using sulfuric acid to make phosphorus available.

A thorough study of the process of nitric acidulation developed by Societe Potasse et Engrais Chimiques (PEC), and evidence of the agronomic success of the plant foods manufactured by this process, convinced Calspray officials that this system would result in a highly satisfactory product.

Calspray's market demands a relatively high nitrogen content in their fertilizer products. By dissolving phosphate rock with the same grade of nitric acid used in the manufacture of agricultural ammonium nitrate, the nitric acid, upon neutralization, becomes a part of the nitrogen plant food in the fertilizer.

In the fertilizer manufacturing processes commonly used in this country, as nearly all readers know, phosphate rock is treated with sulfuric acid to make the phosphorus available as a plant food. The simplest of these treatments is in the manufacture of superphosphate where reactions involved result in a mixture of monocalcium phosphate, some dicalcium phosphate, a small amount of phosphoric acid, much calcium sulfate of "gypsum," some unreacted phosphate rock and the insoluble impurities which occurred in the reacted phosphate rock. By adding a more dilute sulfuric acid in adequate quantities, the mass is sufficiently liquid to filter off the gypsum and other insolubles, giving a solution of phosphoric acid as the end product.

Phosphoric acid may in turn be used to acidulate phosphate rock, with the formation of higher concentration phosphate plant food known as "treble superphosphate," where the plant food values again are a mixture of monocalcium phosphate and dicalcium phosphate. These processes result in producing available P_2O_5 only, as compared to the nitric acid acidulation process, which in one set of reactions gives complete complexes containing two or all three of the important plant foods.

The acidulating nitric acid, in short, has a twofold use. With phosphate values being derived directly from phosphate rock by the addition of one of the plant foods itself, thus adding nothing to dilute the mixture, it is possible to manufacture a high concentration of complete fertilizers in a single process and to obtain exceptional product uniformity.

The basic materials for Calspray's operations are supplied by the recently completed ammonia and nitric acid manufacturing plant at the Richmond refinery of the corporation's parent company, Standard Oil Company of California.

SOCAL's multi-million dollar ammonia plant synthesizes hydrogen derived from natural gas and nitrogen from air to produce anhydrous ammonia at the rate of 300 tons per day. This plant, an M. W. Kellogg design, is one of the largest of its kind in the western states, involving motors totalling 12,000 H.P., synthesis pressure of 4,700 pounds per square inch, and steel storage spheres with capacity of six million pounds of ammonia each.

A part of the ammonia output is oxidized at SOCAL's nitric acid plant and the rest flows by pipeline to Calspray's plant food plants.

The nitric acid plant is a Chemical and Industrial Corporation design, a modification of the duPont process of burning ammonia and absorbing the oxides under pressure. It is the largest single unit of its kind in the country, with capacity to produce 250 tons per day of 100% HNO_3 at approximately 55%-60% strength.

Air is supplied by an electrically-powered centrifugal compressor. An expander, operating on heated tail gas, is used to recover the potential energy in the waste gas from the process.

Liquid ammonia from ammonia plant storage tanks is vaporized and super-heated and fed into a mixer with the air stream from the air heater. The mixture of heated air and ammonia enters a converter and burns on a platinum-rhodium catalyst. The hot mixture of nitric oxide, water vapor, oxygen and nitrogen leaves the converter through an exchanger which heats the waste tail gas for use in the power recovery turbine to permit maximum economy, and passes on to an air heater where filtered compressed air attains the proper temperature for combustion of ammonia.

A waste heat boiler, located in the hot gas stream, produces process and heating steam in excess of the plant requirements. This, combined

with the power recovery turbine, makes the nitric acid plant almost self-sustaining.

Cooling and oxidizing of the combustion gases (changing NO to NO_2) takes place in a multi-pass, horizontal cascade-type cooler. The acid condensed in this cooler is delivered to the proper plate in the absorption column. Uncondensed gases enter the base of the absorption column and flow upward, countercurrent, to water (steam condensate) which is used as the absorbing medium. The acid in the base of the absorption column is swept by a stream of hot air or combustion gas and delivered to the storage tanks. The spent gas, consisting primarily of nitrogen, is reheated as previously mentioned, and is then used to drive the expansion turbine, thus furnishing a large portion of the required operating power of the plant at no cost.

The entire output of nitric acid is carried by pipeline to Calspray's plants.

At Calspray's complex pelleted fertilizer plant, also a Chemical and Industrial Corp. design utilizing the PEC process, ground phosphate rock is acidulated with nitric acid in a series of specially designed stainless steel reactors. The acidulation yields a fluid slurry consisting of a solution of soluble compounds of P_2O_5, calcium nitrate, and minor amounts of other soluble salts, carrying the insoluble components of the phosphate rock in suspension.

Depending upon formulation, some sulfuric acid or some phosphoric acid is added to the slurry, reacting with part of the calcium to make all the P_2O_5 an available plant food. Finally, anhydrous ammonia is added to the train to neutralize the mass and to establish the final balance of the binary relationship, nitrogen and P_2O_5.

In the final product, most of the nitrogen is in the form of ammonium nitrate. The P_2O_5 appears as dicalcium phosphate with some P_2O_5 appearing as ammonium phosphate or monocalcium phosphate.

The slurry of the binary continues from the ammoniation stage to a paddle mixer or pregranulator where the potash content, if required in the formula, is added as potassium chloride or potassium sulfate. Here again, complete homogeneity of product is assured as these soluble salts are dissolved in the slurry, thus insuring that every particle of the product will be uniform.

Following the reactor train is extensive equipment for physically conditioning the product. To make the pellets satisfactorily dense and strong, the moisture of the mass is reduced by a return of fines which have been screened from the end product. As the paste thickens, spherical pellets are rolled by the action of the granulator and at its discharge end appear like a shower of BB shot.

The conveying system between the granulator and the dryers prepares the pellets to avoid either caking or breakdown in the dryer. Temperature regulation of the dryers is important to the quality of the product. After drying, the product is screened, the fines going back to the granulator. The oversize is sent to crushers where it is broken down and added to the fines stream. The product, a sharp narrow cut, free of oversize and fine material, is thoroughly cooled before being sent to storage in a specially designed, temperature controlled rotary cooler.

As a final step, those formulations containing high percentages of ammonium nitrate are given a coating, similar to the treatment of ammonium nitrate prills, which assures continuing good physical properties through storage and free-flowing characteristics through fertilizer applicators.

The pelleted product resulting is uniform in size, non-hydroscopic, and can be stored in bulk. The farmer benefits by having a chemically-synthesized product that is

1. Portion of reactor floor where basic plant food materials are run through a series of reactors in initial stages of forming pellets under PEC process; Calspray's is first U. S. plant to employ this process.
2. Control panel is brain center for production of ammonium nitrate liquids. (Superintendents and safety directors note red tags on control switches at left, reading "STOP. Do not operate. Men at work on equipment operated by this control."
3. Moist granules from granulators are conveyed to these rotary dryers that condition pellets; vertical cones in background are part of system for recovering fines removed from the finished product.
4. Rotary cooler takes pellets from dryer, feeds them to vibrating screen where fines are shunted off on recycle path to granulator.
5. Final step in PEC process is coating of on-size screened pellets with diatomaceous earth to further insure free-flowing characteristics in finished product.
6. Inclined belt conveyor carries finished product to bulk warehouse adjoining plant; various grades stored in bulk are subsequently conveyed to packaging section where bagging and loading are performed.

free-flowing. The high unit nutrient content means that he has less material to handle—fewer bags to load—and assures him of even distribution of the needed nutrients.

A second division of the Calspray operation is the ammonium nitrate plant which makes ammonium nitrate solutions to be sold as liquid fertilizers and to provide basic material to such operations as the company's Modesto, Calif. plant where complete fertilizers are "tailored to the farmer's order" by the addition of phosphoric acid, ammonia, urea, etc.

This division employs the new CSC Stengel Process, licensed by C & I. The heart of this process is the Stengel reactor where superheated liquid anhydrous ammonia vapor joins with pre-heated nitric acid to form ammonium nitrate. The heat of the reaction evaporates water and produces a highly concentrated ammonium nitrate solution.

This solution is discharged into a separator which separates steam from the solution. The vapors from the top of the separator are sent to a partial condenser to recover any ammonium nitrate carried over, which is then recycled back to the process. The rest of the water vapor is condensed in the total condenser.

A third division manufactures ammonium sulphate from anhydrous ammonia and sulfuric acid, the latter obtained largely as a by-product of the SOCAL refinery.

A fourth division manufactures a calcium-ammonium nitrate solution, lime rock treated with nitric acid.

The Calspray capacity production adds up to 950 tons or 25 freight car-loads per day of plant food materials. In addition, the company will store anhydrous ammonia for sale as such and will also convert anhydrous to aqua ammonia for sale, at the rate of 425 tons per day.

Present marketing area includes the eleven far western states. The decision to enter the field of fertilizer manufacture on this large scale was based on an analysis of the potential needs of the present marketing area. Fertilizer sales in this area have more than doubled since 1942 and according to Calspray executives (who note that in this area, as elsewhere, few farmers are fertilizing their pasture lands) "the s u r f a c e has not even b e e n scratched."

Random NOTES & QUOTES

A friend anonymously sent us the following, which actually was circulated among the salesmen of a fertiliber concern:

O

TO ALL SALESMEN: Fall business had been more napid than expected. Fortunately however there seems to be a ristan in the surmentate and we hope to profit thereby. The coming season looks as though it will be brackid in the early portion becoming moistesse later.

We have a hard selling job ahead but nothing that cannot be overcome with muctor namics. Our competition is not impregnable. He has no gonter and he fomently lacks all trace of larthage. If we really get in there and sell—the competition will gonate. He will be forced to do this because no fertilizer company can durnamic in a walage.

Would like to hear from you as to whether your competition has indicated if the zincan flavid days will prevail in the coming season.

Above is our brief current opinion of the general fertilizer outlook and may we have your written opinions of the outlook in your specific territories.—Graf Chart, Marketing Engineer.

O

Dr. Firman Bear, at the recent ACS meeting told them that it is not food, but sheer population pressure and overcrowding which is America's imminent problem. The nation can probably produce enough to feed them, he thinks, but "how long can we continue with the yearly addition of the equivalent of one 60,000 city in every one of the 48 states without finding ourselves in each other's way?" Where are we going to get the water, already short? Where are we going to get the land, much of our most productive already gone to the cities? "The future looks highly exciting, but we'd better go slow about encouraging our young folks to hurry up and produce a lot more of us."

O

Clark Davis, DuPont, told the FFA convention: "It's no longer enough for a farmer to have a strong back, skillful hands, a knack with horses or mules, and a natural instinct for knowing weather, soil, crops and livestock. The American farmer must meet some of the most exacting standards that exist in any career or profession."

O

Julie, you may remember, had her name in letters a mile long in Wisconsin written in fertilizer by her suitor, Jack Kenyon. You will be glad to know that his enterprise paid off. Jack and Julie eloped recently.

O

Shrubs, ornamental trees and the like are half starved, says Raymond Korbobo of Rutgers, at the fertilizer conference there. They are sent to him as "blighted" and turn out really to need fertilizer. Your editors would like to comment that this is a matter for education by the manufacturers of correct shrub and ornamental tree fertilizers.

O

Dam grass is publicized nicely out in the West. The Timothy Dam outside of Portland, Ore., was finished up by aerial seeding of grass (not Timothy) by a duster plane. This will help create a recreational area of several hundred acres around the lake by next Spring.

O

Gas has proven a successful way to kill weeds for a Michigan nurseryman, using Dowfume MC-2. He had quack grass troubles, and set up a test area of seed bed. The gas let the seedlings survive nicely and killed everything else off except vetch.

O

Zero. The University of Minnesota let a field go on down to zero fertility. Then they added lime and fertilizer—got a good crop of 4½ tons of alfalfa per acre from the land.

O

Farm management is the subject of a new manual, intended for both farm reference and college course work. It was written by Gordon R. Sitton of Oregon State with Trimble R. Hedges, University of California.

O

California is pretty durn proud of the fact that it has 21 of the top 100 vegetable growing counties in the US. But Florida comes in with 12, New York, Texas and Wisconsin can boast 8 each.

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ALABAMA

The City of Birmingham is conferring with **Organic Corp. of America** to see what can be done about their 500 daily ton garbage disposal, by way of converting it into an asset instead of a liability. City Commissioner **J. T. Waggoner** is checking into it and thinks now a $2,000,000 plant would do the job.

ARKANSAS

Lion Oil, division of **Monsanto,** has begun construction of a nitric acid concentrator at the El Dorado plant. **Chemical and Industrial Corporation** is designer and contractor. Completion is scheduled for March.

The addition represents a substantial investment. It will concentrate 58% nitric acid now being produced at Lion's two existing units, and is expected to turn out 40 daily tons of 95% nitric. This acid will be used as raw material by another Monsanto plant.

The new unit includes blending facilities, which will permit production of 68% nitric acid. It will be housed in a steel framework equivalent in height to a four-story building.

ARIZONA

Apache Powder Co. is reported to be building an ammonia plant at Benson, which is to have a capacity of 30 daily tons.

CALIFORNIA

Cal-Spray last month dedicated its new $16,000,000 plant at Richmond and it at once began to work up to production levels. It is calculated to turn out 1375 daily tons of fertilizer materials: 300 tons pelletized; 200 tons liquid calcium nitrate; 300 tons liquid ammonium nitrate; 150 tons ammonium sulphate; 425 tons aqueous ammonia—daily.

FLORIDA

Henry J. Kaiser is planning a pilot chemical extraction plant near Lakeland where waste products from phosphate will be used to extract a chemical. All efforts to determine what chemical and what process have been unsuccessful. Phosphate producers will follow this development with interest.

• • •

Re-Mark Chemical has purchased for a reported $125,000 the **R. W. Brown & Co.** fertilizer plant at Goulds, has renamed it Hurricane Fertilizer Co., and will spend $100,000 to increase plant capacity. **R. W. Brown** will remain as general plant manager.

• • •

American Cyanamid has unveiled an elaborate system for the detection and prevention of pollution of air and stream from phosphate industrial gases. Adapted from equipment developed for tracking the earth satellite soon to be launched, **Arthur Crago** says, the devices will measure and record dusts too fine to be seen by the naked eye and gases too light to be detected by any previously existing equipment.

ILLINOIS

Hamilton Produce Co., Monmouth is in production with its new liquid fertilizer operation.

IOWA

Hi-Yield has installed 8000 gallons of liquid complete analysis storage capacity near their anhydrous tanks in Northwood.

LOUISIANA

United Carbon will invest $750,000 in four added reactor units at their Louisa carbon black operation.

• • •

Freeport Sulphur has signed a contract under which they undertake to mine a sulphur deposit six miles off the Louisiana coast which was discovered by **Humble Oil.** It is in 45 feet of water, and is called a major new sulphur source. Operations are expected to begin in late 1958.

MISSISSIPPI

Mississippi Chemical's sponsored new plant, **Coastal Chemical** is now authorized to get under way at Pascagoula, Miss. Intent is to be ready for the 1958 fertilizer season.

• • •

Delta Ammonia Company has been chartered at Clarksdale, listing capital stock of $15,000.

• • •

DeSoto Chemical and Supply Co. has been chartered at Hernando, with capital stock listed at $100,000.

MISSOURI

Lafayette Farm Supply, Lexington, has begun operation of its new complete liquid fertilizer plant, which was engineered by **Ellsworth Equipment & Engineering Company** of Indianapolis. The installation includes anhydrous ammonia converter and a completely automatic mixing system, known as Hydro-Cycle. Plant capacity is 15 hourly tons. Ezy-Spread is the Lafayette trade name.

MONTANA

Anaconda has contracted for anhydrous ammonia from **US Steel's** new $18,000,000 plant near Provo at which they will use at their plant Anaconda for production of "Ammo-Phos."

NEW JERSEY

Kolker Chemical has installed new facilities at Newark which will, when in production, double their present methyl bromide capacity.

OHIO

City of Marion officials are reported still studying the plant plans suggested to them by **Organic Corporation** for the conversion of garbage to fertilizer.

OKLAHOMA

Nichols Fertilizer & Chemical, Oklahoma City, held an open house for dealers and others to view the plant enlargement in which they have invested $250,000. The plant was only 3 years old, and was acquired by Nichols a year ago.

PENNSYLVANIA

Haller Oil Co., whose plan for expansion was limited by local ordnance, have been granted a permit to build in Lancaster their ammonia storage plant. They are permitted to store up to 50,000 gallons of anhydrous ammonia, and the plant must be located 900 feet from the road.

• • •

Pittsburgh Consolidation Coal, Pittsburgh, is moving heavily into cresylic acid, one of whose markets is the crop chemical field. They have one plant just started and another nearly completed, located at Newark, N. J. and at Cresap, W. Va. The Cresap plant will be in production early in 1958.

TEXAS

Jefferson Lake Sulphur will spend $2,000,000 at its **Merichem Co.,** Houston, subsidiary. This will jump cresylic acid-phenol capacity to 300,000 monthly gallons, and bring to 1,000 monthly tons its sodium sul-

fide production. They are now hunting a site on the Houston Ship Channel for a $3,500,000 petrochemical plant.

• • •

Virginia-Carolina, according to vice-president **Cecil Arledge,** hopes to to improve fertilizer sales by adoption of a redesigned bag, more diversified advertising, an incentive program for salesmen and construction of a liquid fertilizer plant in the mid-West.

WASHINGTON

Cominco was expecting, as we went to press, to have in operation this month its new $1,000,000 plant in the Valley.

AFRICA

The Federation of Rhodesia and Nyasaland has concluded a study which seems to justify production of 25,000 annual long tons of N and proposes the development of facilities, step by step until this goal is reached.

• • •

The Federation is building an $8,400,000 plant near Salisbury for the production of superphosphate.

CANADA

Nichols Chemical will build at Valleyfield, Que. a plant which will be the first hydrofluoric acid plant in Canada. It will turn out both aqueous and anhydrous.

• • •

Canadian Bechtel, Toronto, has been given the contract to build **Imperial Oil's** $25,000,000 petrochemical plant at Sarnia.

• • •

Northwest Nitro Chemicals have started up several units of their new $21,500,000 Medicine Hat plant, with full production expected by the end of the year.

ENGLAND

Borax & Chemicals, British subsidiary of **American Potash & Chemical,** has completed a new storage warehouse at the Bootle Plant, near Liverpool, which will handle 1,000 tons of bagged boron products—66,000 cubic feet of space.

KOREA

Demag, Lurgi and **Siemens,** — all West German concerns are said to be interested in bidding on the two $20,000,000 fertilizer plants projected for South Korea.

PAKISTAN

Montecatini and **Al-Saldo,** Italian fertilizer engineering concerns, have both sent experts to carry out a survey for a projected nitrogenous fertilizer plant at Multan to cost $35,700,000, and to produce 100,000 annual tons.

PUERTO RICO

Gonzales Chemical expect their $12,000,000 plant in Guanica to be in production early next year. It is an almost completely "push-button" operation. **Ochoa Fertilizer** of Hato Rey, whose owners formed the Gonzales operation, are expected to be the principal purchases of the new plant's output, which will be shipped by barge to San Juan for distribution from there.

VENEZUELA

The Government has purchased several thousand acres near Moron, Carabobo, chosen for seaboard proximity, as the site for the $15,000,000 "Petrochemical Industry" project, which includes 11 plants whose output will include 150,000 annual tons of fertilizer.

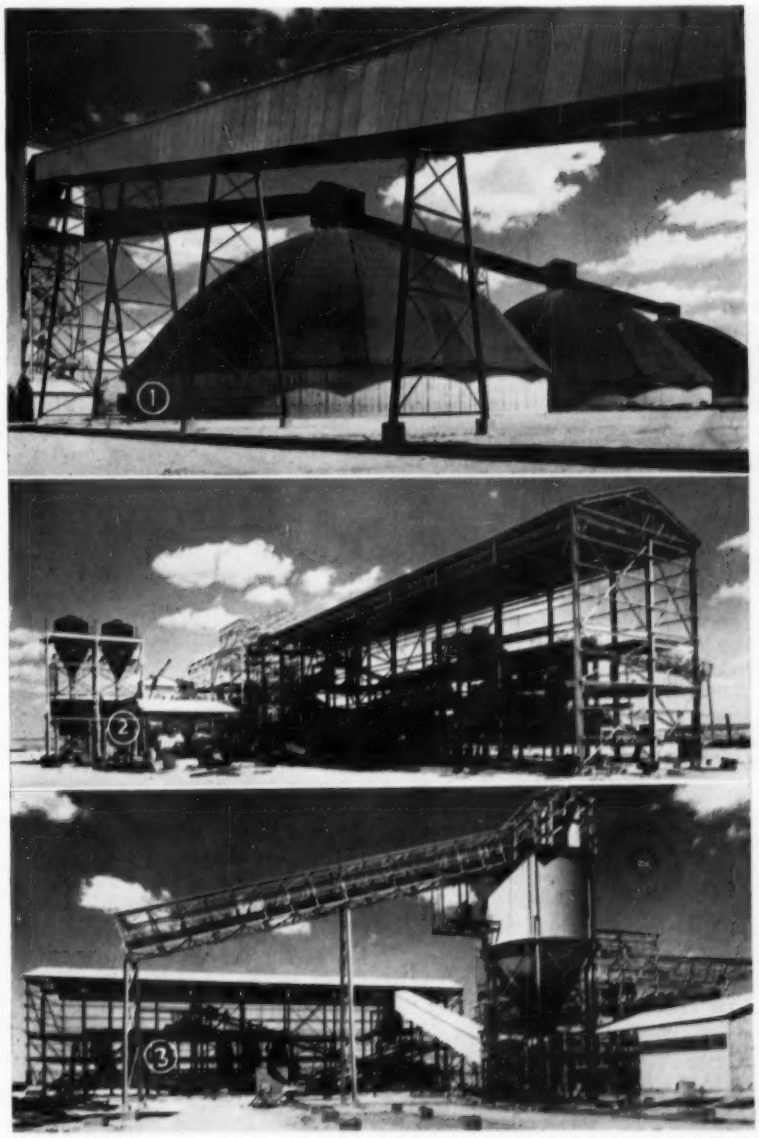
CONSTRUCTION AT NATIONAL POTASH MINE ON SCHEDULE

Construction work at National Potash Company's new mine near Carlsbad, New Mexico, is proceeding on schedule with shipments due to begin in February.

Richard C. Wells, president of the company which is jointly owned by Freeport Sulphur Company and Pittsburgh Consolidation Coal Company, said that the two mining shafts are down to the ore level, the 21-mile water pipeline is in operation, and the refinery and other facilities are nearing completion.

The $19,000,000 project will have an annual capacity of 400,000 tons of high grade muriate of potash guaranteed 60% K_2O. The company will offer fertilizer manufacturers a granular product of minus 10 plus 28 mesh and a standard product of minus 28 plus 48 mesh.

Product storage buildings (upper picture) already completed, have a capacity of more than 100,000 tons. The crushing and screening building is shown (center picture). Its daily ore capacity will be 4,800 tons. Two vacuum crystallizers are at the left. A 400-ton ore surge bin in the refinery area is nearing completion (lower picture). At the left is the crushing and screening building and at the right is the refinery section.



"Safety Pays a Profit" Says

ED BURROUGHS AT SAFETY MEETING

It is no secret that in the entire fertilizer industry the present economic condition is very unsatisfactory. Because of this fact, there is a general search for areas in which expenses can be cut.

In most phases of this economic situation the industry has no more control than the public in general. There is one area, however, in which the industry has full control—the costs of accidents in their plants. The temptation to squeeze the safety program in budget trimming can backfire and result in increased losses from accidents.

A few years ago there was pointed out to a production executive the possible reduction in direct cost per ton of fertilizer through reduction of the abnormally high accident rate. He was immediately interested because he said that was as great as the profit per ton many years in the thirties.

Today with a moderate safety program that company can show a direct saving on Workmen's Compensation premium payments of $.10 per ton. On a conservative basis that means an additional saving in indirect costs of $.30 to $.50 per ton. Should such a saving be jeopardized by squeezing the safety program out of the budget?

The work of the Fertilizer Section of the National Safety Council is directed toward physical and economic benefits to the employee and economic benefits to the employer. Is there evidence of achievement of these ends?

The results referred to above were coincident with activity in the Fertilizer Section.

In New York State one manufacturer is responsible for about 30% of the fertilizer manufacturing labor. The Workmen's Compensation insurance rate was unusually high —average manual rate 1949 to 1952 was $6.15 per $100.00 of payroll.

That company gave the Fertilizer Section its complete support and encouraged activity of its employees in the work of the Section. Their representative served as Chairman of the Section and gave much time to the general promotion of the Section's work. Coincident with this period of interest and activity, the New York rate, heavily influenced by the improvement of the accident rate of this employer, dropped steadily until it now stands at $4.50 per $100.00 of payroll. This represents a 39% decrease in Workmen's Compensation Insurance costs.

In North Carolina in 1952 and 1953 the State Department of Labor put on a two year safety program for the fertilizer industry. This effort was with full cooperation of the member companies of the Fertilizer Section. The results of this program were very gratifying. In 1950 and 1951, the two years before the program, the accident frequency for the industry in North Carolina averaged 20.3 with a high in 1951 of 24.3. The average for 1952 and 1953, the two years during the program, was 17.4 —a 15% reduction.

For 1954 and half of 1955, following the program, the average frequency dropped to 9.8. This was less than 50% of the pre-program average.

These facts prove that safety work pays off. The efforts of the Fertilizer Section of the National Safety Council have benefited those who have taken part in its activities and also those in the industry who have not taken part.

The value of the work of the Section will be proportionate to the interest of the industry in its activities and the willingness of industry to allow its employees to carry on the Section activities.

OFFICERS

General Chairman, E. O. Burroughs, Jr., Manager, Insurance Department, F. S. Royster Guano Company, Norfolk, Va.; Vice-Chairman, George Dietz, Safety Director, Baltimore, Md.; Secretary, G. L. Pelton, Personnel Manager, The Smith Agricultural Chemical Company, Columbus, O.

EXECUTIVE COMMITTEE

C. K. Brutcher, Supt., New Albany Indiana Operation, Davison Chemical Division of W. R. Grace & Company, New Albany, Ind.; V. A. Frizzell, Vice President, Triangle Fertilizer Company, Salinas, Calif.; R. A. Fischer, General Manager, Milford Fertilizer Company, Milford, Del.; O. E. Perry, Supt., C. O. Smith Guano Company, Moultrie, Ga.; E. Nichols, Nichols Fertilizer and Chemical Company, Oklahoma City, Okla.; B. A. Schlagenhauff, Brea Chemical Company, Brea, Calif.; S. Cottrell, Director of Operations, Olin-Mathieson Chemical Company, Little Rock, Ark.; M. C. Ellison, Safety Director, Mississippi Chemical Company, Yazoo City, Miss.; F. Wayne High, Operations Manager, Baugh Chemical Company, Baltimore, Md.; R. Hugg, Personnel Supervisor, International Minerals & Chemical Company, Chicago, Ill.; G. B. Morris, Assistant Production Manager, Southern States Cooperative, Richmond, Va.; G. W. Pittock, William Stone Sons, Ltd., Ingersoll, Ontario, Canada; M. F. Wharton, Treasurer, Arizona Fertilizers, Inc., Phoenix, Ariz.

RESUME OF MEETING

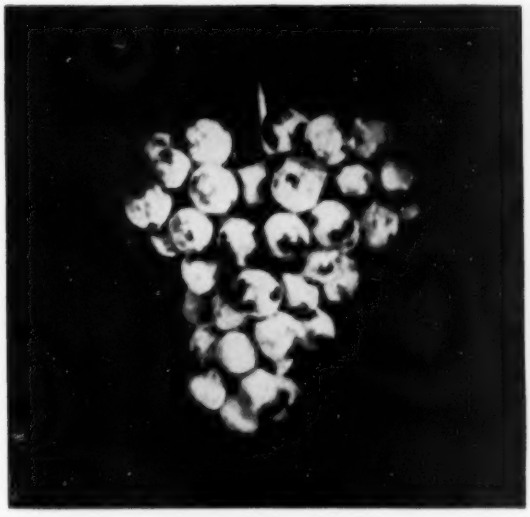
The fertilizer section of the National Safety Council met in Chicago, October 22, for a two day session in conjunction with the national safety congress, presented an excellent program,

H. B. DeVinny, director of industrial relations, **Davison Chemical Co.,** who led off the first day's program, told the group that Davison Chemical's management recognizes the value of safety as a business fundamental so make it a regular part of the company's operation. It's safety work has its portion of the budget. Management is proud of the fine safety records in its plants and the prestige it brings; acknowledges the monetary value in a good safety program.

Safety begins on the drawing board when a plant is planned, built; on its wiring, equipment; operation; personnel. The fine safety records in Davison's plants reflects top management interest and support. It further shows that operating personnel have been thoroughly indocrinated with the need for unrelenting awareness and alertness toward safety. Management must not only supply the funds for a safety program but supply the interest in the program and its progress. Safety is good public relations; is rewarding financially. A good reporting job on accidents must be done to keep management informed as to the efficiency and effectiveness of your safety program.

(Continued on page 50)

IN GRAPES, POTASH-ENRICHED FERTILIZERS MAKE THE DIFFERENCE



with sufficient potash

without sufficient potash

Grapes or green beans—in anything that grows—good rich soil makes the difference between good crops and bad. Balanced fertilizers are needed to insure healthy bumper crops. And it's the potash in these balanced fertilizers that builds resistance to plant diseases and improves quality and yield.

USP's high-grade muriate of potash has the highest K_2O content and is free-flowing and non-caking—important advantages in the manufacture of these modern fertilizers which help American farmers to better crops and better incomes.

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GRANULATE THE SIMPLE PROFITABLE WAY

It's a proven fact — there are more Blue Valley Granulators operating in fertilizer plants today, than any other make.

One reason why — Blue Valley engineers originated controlled liquid phase granulation! This means higher quality fertilizer . . . lower operating cost . . . MORE PROFIT FOR YOU!

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CF STAFF PICTURES OF SAFETY PEOPLE

1. G. L. Pelton, The Smith Agricultural Chemical Co., Columbus, George F. Dietz, Fertilizer Mfg. Cooperative, Inc., Baltimore, E. O. Burroughs, Jr., F. S. Royster Guano Co., Norfolk.
2. Billy Creel, North Carolina Dept. of Labor, Raleigh, H. S. Baucom, North Carolina Industrial Commission, Raleigh.
3. C. S. Griffith, Sr., Virginia-Carolina Chemical Corp., Cincinnati, J. Lauren Shopen, Consumers Co-Op. Assn., Kansas City.
4. Paul T. Truitt, National Plant Food Institute, Washington, Mike C. Ellizon, Mississippi Chemical Corp., Yazoo City, W. D. Smith, Southern States Coop., Richmond.
5. W. E. Jones, Northwest Coop. Mills, St. Paul, C. K. Brutcher, Davison Chemical Co., Div. of W. R. Grace & Co., New Albany, Tom O'Brien, Northwest Coop. Mill, Green Bay, Nick J. Gotterdam, Davison Chemical Co., Div. W. R. Grace & Co., Columbus.
6. W. A. Stone, Wilson & Toomer Fertilizer Co., Jacksonville, Alden Viasak, Toledo, Thos. N. Williams, Madison, Wisc., S. L. Solomon, Indianapolis, all with F. S. Royster Guano Co.
7. Grayson Morris, Southern States Co-operative, Richmond, Quention Lee, Cotton Producers Assn., Atlanta, O. E. Perry, C. O. Smith Guano Co., Moultrie.
8. J. R. Hollingsworth, Carrollton, Harold Green, Cordele, both with Cotton Producers Assn., R. E. Kelly, Swift & Co., Chicago, Dale C. Washburn, Northwest Co-Op Mills, Inc., Winona.
9. T. J. Bosman, Federal Chemical Co., Nashville, M. L. Barton, Swift & Co., National Stock Yards, Ill., Leonard W. Rumpf, Swift & Co., Mason City, Iowa, F. E. Harrigan, Swift & Co., Calumet City, Ill.
10. Chas. J. Dewitt, Liberty Mutual Ins. Co., Atlanta, answers questions at close of meeting.
11. Vernon Gornto, Smith-Douglass, Norfolk, presents plaque to Curtis Cox, Virginia-Carolina Chemical Corp., retiring general chairman.
12. John C. Kato, National Safety Council, Chicago, Vernon S. Gornto, Smith-Douglass, Norfolk.

Employees of the Halifax, Nova Scotia fertilizer plant of Canadian Industries Limited, and the Maritime sales offices of the company's agricultural chemicals division, recently celebrated the achievement of a safety record of more than 13 years without a lost-times accident. This won for them for the third successive time the C-I-L Prize, highest award under C-I-L's no-accident record plan. Photo shows Dr. Ira P. Macnab, general manager of the Halifax public service commission (left) presenting the "outstanding safety record" plaque of the National Safety Council to John Cree, plant foreman. Congratulating the employees of their accomplishment, W. T. D. Ross, C.I.L. vice president, said: "In this achievement you have shown your ability to take on temporary help and supervise them in safe habits in an industry which unfortunately has a relatively high accident frequency rate. Experience has shown that safe plants are good plants and that safe employees are good employees."

SAFETY

(Continued from page 46)

H. S. Baucom, safety director of the **North Carolina Industrial Commission** in speaking of a safety program for the average plant said that safety is not easy to sell and recommended getting to the top people in a plant to sell safety. If they were sold, then they would carry it along. He outlined some of the key factors in a safety program, all of them designed to accomplish two major objectives—to save lives and prevent injuries through safety practices and to make plants operate more efficiently and effectively.

They were: (1) Get rid of hazardous conditions. (2) Guard any hazard you can't eliminate. (3) See that workmen are protected with protective clothing including goggles and safety shoes. (4) Set up plant rules and go over them carefully with the men and (5) teach them in words they can understand. (as a footnote to number 3 above H. B. DeVinney in his talk made the statement that unions are now pushing for management to furnish safety clothing).

Charles J. DeWitt, assistant divisional manager, Loss Prevention Dept., **Liberty Mutual Insurance Co.,** used a dummy person rigged with a voltage guage to show the dangers of electricity and how quickly death can come through negligence or lack of knowledge in working with or near electrical equipment or wiring. He urged a quarterly check throughout every plant to be sure that all electrical connections are in proper condition, not damaged by corrosion or defective in any way, as the best insurance that the electrical hazard has been eliminated at least to the extent that such accidents will be prevented if care and caution are exercised.

He cited many examples, using the dummy to show the immediate effect when a person unwittingly becomes the carrier for current. He stressed the importance of a ground wire on all electrical equipment to prevent current from passing through an operator should there be a short, altho' a ground wire in itself may not offer safety due to damage of some kind; hence the need for frequent checks.

He demonstrated how standing on a wet floor, or ground, can cause a short by placing a sheet of blotting paper between the dummy and the current which as long as it was dry protected the dummy but when wet caused the current to surge through. He pointed to the ordinary brass light socket with paper insulation as one of the greatest killers as it is easy for the paper to absorb moisture thus becoming potentially dangerous.

W. T. Bodiford, safety supervisor for the **Florida Industrial Commission,** told the group that you can't legislate safety because it is something that has to be trained in people, you have to make them safety-minded before they can practice safety.

And supervisory training is the most important factor in the program. All of the safety work in Florida, in each industry, had shown this to be the most important single factor. To do this job they obtained the right people for the work and paid them well, and set up a workable educational program.

Glenn F. Griffin of the **National Safety Council** wound up the program with a talk on conducting a safety meeting. Audience participation was important so he steered the group present to get suggestions as to what constituted a good meeting and came up with such key points as: careful planning, enthusiasm, sticking to the subject, broader member participation, lack of interest because previous meeting didn't accomplish anything.

In addition to the functions planned by the National Safety Congress the Fertilizer Section gathered for lunch the second day of their meeting; the first day the National Plant Food Institute gave a luncheon in honor of the executive committee at which Paul T. Truitt, executive vice-president of NPFI acted as host.

Note: Detailed reports in Commercial Fertilizer for December on Safety talks for the single plant operator and for multiple unit plants by C. S. Griffith, Virginia Carolina Chemical Corp., Cincinnati, and J. Lauren Shopen, Consumers Cooperative Association, Kansas City, Mo.

OVER 10 MILLION ACRES UNDER '57 RESERVE

Wheat farmers signed agreements placing 10,670,773 acres in the Soil Bank's 1957 winter wheat Acreage Reserve program through November 2, USDA announced. If the farmers signing the agreements comply with the requirements of the program, they will be eligible for a maximum of $197,651,699 in Acreage Reserve payments.

According to reports from State Agricultural Stabilization and Conservation (ASC) offices in the 36 States of the commercial wheat area, this amount of acreage was pledged in 194,918 agreements signed by farmers. The number of agreements signed has been revised from when it was reported that 195,260 agreements had been signed. In that report (USDA 3342-56) 10,571,163 acres had been placed under the program, for which participating farmers would receive maximum payments of $196,634,006.

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In ammoniation, many conditions influence phosphate performance — temperature, moisture, time and rate of ammoniation, and methods used. And each of these can be influenced by your choice of solutions.

That's why you need a broad selection of nitrogen solutions with a wide range of chemical and physical characteristics. And Sohio's complete line helps you best adjust ammoniation to your methods and materials.

The man from Sohio will be happy to help you select the exact solution you need for the best job for you. **And Sohio's technical services are always available when you need them.**

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Personals

William H. Wilson, 49-year-old executive from New Orleans, is the new president of **Virginia-Carolina Chemical Corporation.**

He was formally elected head of the $65,000,000 fertilizer and chemicals concern at a directors' meeting in Richmond, Va., October 29.

Mr. Wilson, a native of Saginaw, Michigan, has been executive vice-president of the $45,000,000 **Standard Fruit and Steamship Company.**

He joined the executive staff of V-C October 1 and made a tour of the company's facilities throughout the nation before his formal election as president.

At the same time, **William C. Franklin,** who has been serving as acting president since a change in management control, has become permanent chairman of the V-C board, succeeding former Governor **John S. Battle** as board chairman. Gov. Battle will continue to serve as a member of the board.

Mr. Wilson has a reputation as a progressive businessman in various fields. He began his business career in 1940 with the Illinois Tool Works where he rose to become administrative assistant to the president.

In 1944 he joined the management engineering firm of Booz, Allen & Hamilton in Chicago, where he served as consultant to such concerns as Radio Corporation of America, Squibb and Columbia Pictures.

From 1946 to 1951 he served as assistant to the executive vice-president of the Johnson Wax Company, then moved to New Orleans as executive assistant to the president of Standard Fruit and Steamship Company. Within a few months he became vice-president in charge of operations and, in 1953, executive vice-president.

The Potash division of International Minerals & Chemical Corporation has appointed Jack von Mettenheim a sales representative in the Midwest, according to Nelson White, vice president in charge of the division. Mr. von Mettenheim has been associated with International Minerals & Chemical Corporation since May 15, 1953.

Dr. David Stern has been named assistant manager of the Whittier (Calif.) Research Laboratory of **American Potash & Chemical Corporation,** according to announcement by **Dr. William Emerson,** manager of the laboratory.

Stern previously had been head of the research lab's electrochemicals section since he went with the company in April of 1955.

• • •

Kenneth L. Weeks, Jr. has been appointed superintendent of **Olin Mathieson Chemical Corporation** operations at Brunswick, Georgia, according to an announcement by **James F. Newell,** manager of operations of the company's industrial chemicals division, Baltimore, Md. Mr. Weeks joined Olin Mathieson in 1952. Now under construction, the Brunswick facilities are expected to be ready for use shortly after the first of the year. They will provide chlorine and caustic soda for use in the South Atlantic states.

• • •

H. V. Kindseth, in charge of the **Bemis Bro. Bag Company's** department of physical research in Minneapolis, has been appointed director of research for the company. The announcement was made by **F. G. Bemis,** president. Mr. Kindseth joined the Bemis organization in 1931.

• • •

Richard L. Moore, formerly assistant treasurer and director of personnel and public relations of **Foster D. Snell, Inc.,** has joined the public relations division of **W. R. Grace & Co.** Mr. Moore will be responsible for the public relations of two of Grace's seven chemical divisions—**Grace Chemical Company division** and the **Polymer Chemicals division.**

Donald P. Cross has been appointed traffic manager for the Southern Nitrogen Company, Inc., Savannah, Georgia. Mr. Cross has had 22 years experience, with Kroger Company as rate analyst and as traffic manager for Island Creek Coal Company. He served five years in the United States Army as transportation officer in the Quartermaster General's office at Seattle, Washington.

• • •

R. W. Starostka has joined the department of agricultural chemical research of the **Davison Chemical Company,** division of **W. R. Grace & Co.**

• • •

St. Regis Paper Company announces that **C. C. Keefer** has been appointed product sales manager for fertilizer in the Midwestern district of the multiwall packaging division. Mr. Keefer will continue to maintain headquarters at the Louisville, Kentucky office.

J. A. Monroe, vice-president of the Smith-Douglass Co., has announced that Russell Spivey, manager of the Smith-Rowland division, joined the parent company as fertilizer salesmanager for the Norfolk branch. L. Gavaza succeeds him as manager of the Smith-Rowland division. Mr. Gavaza joined the Smith-Rowland Co. in 1942. Mr. Spivey joined Smith-Douglass in 1951. Mr. Spivey is shown at left.

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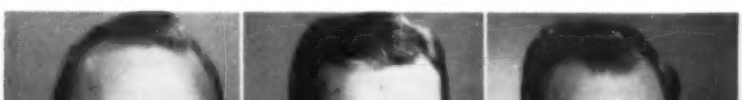
Eastern Sales Office: 380 Madison Avenue, New York 17, New York
General Offices: 135 So. La Salle Street, Chicago 90, Illinois
In Canada: Canadian Locomotive Company, Ltd., Kingston, Ontario, Canada



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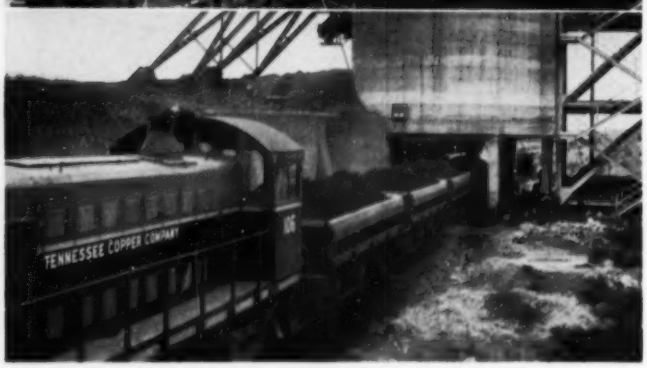
- MANGANOUS OXIDE
- COPPER SULFATE
- ZINC SULFATE
- IRON SULFATE
- MINERAL MIXTURES



Over 30 years experience in nutritional trace element manufacture, research and application to mixed fertilizers

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YOU can save money, time, plant space and effort through the use of our custom formula mineral mixture service.

WE back up our products with service, research and technical assistance.

For further information please make requests on your company's letterhead.

TENNESSEE CORPORATION

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C. T. Fauver has been named sales and field engineer for the multiwall packaging division in the Louisville area. He was previously a field engineer in the Ohio area.

• • •

Henry E. Wessel has been appointed manager of marketing research for the general development department of **Monsanto Chemical Company's** research and engineering division. At the same time, **John O. Printy,** who has been manager of marketing research, was appointed manager of commercial development in the department. Both appointments are effective immediately.

• • •

Dr. Conrad A. Elvehjem, noted biochemist and dean of the graduate school at the **University of Wisconsin,** was named the 1956 recipient of the **Charles F. Spencer Award** for meritorious contribution to the field of agricultural and food chemistry. The award was founded by **Kenneth A. Spencer,** president of **Spencer Chemical Company,** in honor of his father.

• • •

Z. A. Stanfield has resigned from the Tennessee Valley Authority development branch, division of chemical development, after approximately 12 years' service to accept a position in the central engineering department of the **Diamond Alkali Company,** Cleveland, Ohio.

Mr. Stanfield's work with TVA was concerned with studies of the economics of new processes. **Norman L. Spencer** has been appointed to carry on the studies of process economics at TVA.

• • •

The Hammond, Indiana, plant of **Stauffer Chemical Company** has recently added **Billy Dean Scallorn,** a chemical engineer, to its technical staff.

• • •

Ca'ifornia's State Director of Agriculture **W. C. Jacobsen** has announced the appointment of **Chas. V. Dick** as assistant director, and of **Allen B. Lemmon** as chief of the division of plant industry, the position formerly occupied by Mr. Dick.

The position of assistant director to which Mr. Dick has been appointed is a new one, created with the approval of the State Personnel Board and the State Department of Finance.

Mr. Dick will be in charge of the Department's legislative program, and will be the Director's liaison officer for the Division of Plant Industry.

Mr. Lemmon's duties will be assumed by **Robert Rollins,** assistant chief, who will become acting-chief-in-charge of the bureau.

• • •

Dr. William L. Garman has been appointed vice-president in charge of the agricultural chemicals division of **Best Fertilizers Co.,** it was announced by **Lowell W. Berry,** president.

Dr. Garman formerly was agricultural service manager for the Grand River chemical division of **Deere and Co.,** Tulsa.

• • •

L. N. West, executive vice-president, **Wilson & Geo. Meyer & Co.,** announced in San Francisco three important personnel advancements involving the Portland, Ore. and Los Angeles, Cal. district offices of the firm, effective Nov. 1, 1956.

Mr. West said **John M. Hooper,** manager of the Portland office since 1952, is promoted to Los Angeles to be manager of agricultural chemical sales in the Pacific Southwest.

Clifford S. Culley, with ten years service in the Los Angeles office, is now manager of the Portland office, succeeding Mr. Hooper.

Thomas H. Lathe, who has been with the firm many years, is manager of the newly formed market development department, Pacific Southwest territory, with headquarters in the Los Angeles office.

• • •

At a special meeting of the board of directors of **The Frank G. Hough Co.,** Libertyville, Ill., a subsidiary of **International Harvester Company. Frank G. Hough,** founder and president of the company, was elected to the newly created office of chairman of the board of directors.

G. A. Gilbertson, formerly executive vice-president and general manager, was elected president and chief operating officer.

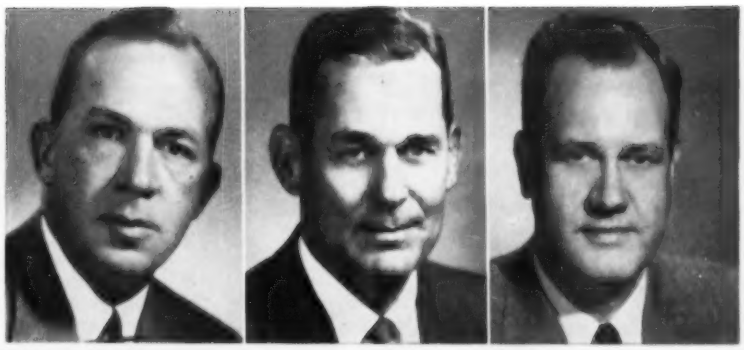
• • •

Dr. Ray E. Neidig, vice president of **Balfour, Guthrie & Co., Ltd.** and manager of their Fertilizer Division, announces the appointment of **George B. Simons** as field supervisor for North Dakota and western Minnesota agricultural areas.

Mr. Simons was formerly with North Dakota Extension Service for many years, where he was actively engaged in the promotion of better agricultural and soil practices.

• • •

Consolidated Rendering Company has made some changes in their organization recently: **L. E. Smith**



Changes in the sales department of the United States Potash Company division of the United States Borax & Chemical Corporation: L. Ralph Boynton, left, has been made assistant salesmanager. Ralph has been Southern salesmanager for the past year and in the Atlanta office since 1939. He will move to New York as assistant to John E. Fletcher, salesmanager. Robert H. Walton, center, has been promoted to the position of manager of the Atlanta office. Mr. Walton has been with the company since 1933 and in the Atlanta sales office for six years. Joe F. Stough has joined the organization as sales representative in the mid West territory formerly served by Colonel Charles E. Littlejohn, who will be given a leave of absence of sufficient duration to enable him to regain his health, at which time he will be given other assignments within the sales department.

Dr. David Howe who has joined the research development and engineering staff of Commercial Solvents Corporation as agronomist, it has been announced by Maynard C. Wheeler, vice president. Dr. Howe will make his headquarters at CSC's Research Laboratories at Terre Haute, Ind.

Commercial Solvents Corporation has named Walter M. Young to its agricultural chemicals marketing and distribution organization, according to M. K. McConnell, Southern sales manager for CSC's agricultural chemicals department. Mr. Young is assigned to the Southern sales district with headquarters at Sterlington, La., covering Texas, Oklahoma and parts of Arkansas and Louisiana.

former president is now chairman of the board of directors. **C. K. Leveck** is president; **W. E. Meeken,** vice president and manager, fertilizer dept. **L. L. Horton,** vice president and general superintendent; **J. H. Downing,** treasurer.

* * *

The appointment of **Tom H. Stewart** as technical service manager for the Grand River Chemical Division of **Deere & Company** is announced by **John R. Taylor, Jr.,** sales manager.

In his new duties, Mr. Stewart will render technical service to fertilizer manufacturers in connection with the Company's new line of nitrogen products including urea, urea solutions and ammonia.

Mr. Stewart has wide experience in all phases of fertilizer manufacture and formulation. Previous to his recent appointment with Grand River Chemical, he was employed for many years by the **International Minerals and Chemical Corp.** fertilizer division.

* * *

Harry J. Fisher, chief chemist of the analytical chemistry department, **The Connecticut Agricultural Experiment Station,** was elected president of the **Association of American Pesticide Control Officials** at its annual meeting in Washington, October 20.

* * *

American Potash & Chemical Corporation has announced two promotions in the research department of the company's main plant at Trona, Calif.

Dr. Donald Garrett has been named as assistant manager Trona research department, while **Stanley Cohen** has been appointed head of the new products section.

Dr. Garrett succeeds **Harold Mazza** who recently was appointed manager of research at AP&CC's Los Angeles Plant.

* * *

Thomas J. Clarke, G.L.F. Soil Building Service, Ithaca, N. Y., has been made controller.

A recent addition to the Western division staff of the Velsicol Chemical Corporation is Jack Lomax, entomologist. Mr. Lomax is working under the direction of George Weldon, manager of agricultural chemical sales on the West Coast.

R. G. Diserens, safety director, **Phillips Chemical Co.,** Bartlesville, Okla., has been made administrative superintendent of the Coulee plant, **Phillips Pacific Chemical Co.,** Kennewick, Wash.

* * *

Frank Haston is now manager of **M.F.A.'s** bulk fertilizer plant in Slater, Iowa. He was formerly area representative for the M.F.A. Plant Foods division working with anhydrous ammonia. **Dave Farley,** former M.F.A.'s bulk plant manager, resigned.

* * *

Clarence E. Elsas, a leader in the southern cotton textile industry, was elected president of the 88 year old **Fulton Bag & Cotton Mills,** succeeding **R. O. Arnold** who resigned to devote full time to private interests.

Announcement of the action taken by Fulton's board of directors came from **Bernard A. Mitchell,** chairman of the company's executive committee, following a meeting held in New York City recently.

After attending the University of Pennsylvania, Mr. Elsas began his business career with Fulton in 1926, in sales and clerical work. He served in many of the Company's coast to coast offices and manufacturing plants in various departments. In 1938 he was transferred to the company's Atlanta headquarters in an executive capacity. He was elected executive vice president in June 1956, when a new controlling group purchased the Fulton Bag & Cotton Mills.

Tom E. Martin has been appointed field service engineer for U.S.I.'s Chemical Sales Department, it has been announced by L. A. Keane, vice-president in charge of sales for U. S. Industrial Chemicals Co., division of National Distillers Products Corporation.

The appointment of **Charles D. Masone** as New York City sales representative has also been announced by **Jason M. Elsas.**

Appointment of **M. M. (Mike) Mills** as sales manager, bag division, New York branch of **Fulton Bag & Cotton Mills** was made October 18. The appointment was made public by **Jason M. Elsas,** vice president and bag division general manager.

Donald M. Lins has been appointed sales representative for the bag division representing the company in southern Florida.

Announcement of the appointment of **John W. McIntyre** as sales representative for Kansas City and surrounding areas has been made by **Jason M. Elsas.**

Spencer Chemical has assigned these three sales representatives: William A. Sime, left, to Ohio; Thomas L. Campbell, center, North Carolina; Ned P. Haldeman to replace Mr. Campbell in Mississippi and Louisiana.

OBITUARIES

Mary Willson Folger, wife of Dr. M. Farthing Folger of Allied Chemical and Dye, Sept. 18 in Atlantic City during the American Chemical Society convention.

William O. Harned, 73, Federal Chemical Company secretary-treasurer, in Louisville, Sept. 28.

Dewey K. Lange, 59, half-owner of Lange Brothers, St. Louis, October 9 of a heart attack.

Wilfred Hornsby Wright, 71, retired authority on seeds and weeds, Sept. 22 while on a sketching trip near his Canadian home.

Rupert T. Zickl, member of Virginia-Carolina Chemical board, Sept. 25, after a prolonged illness.

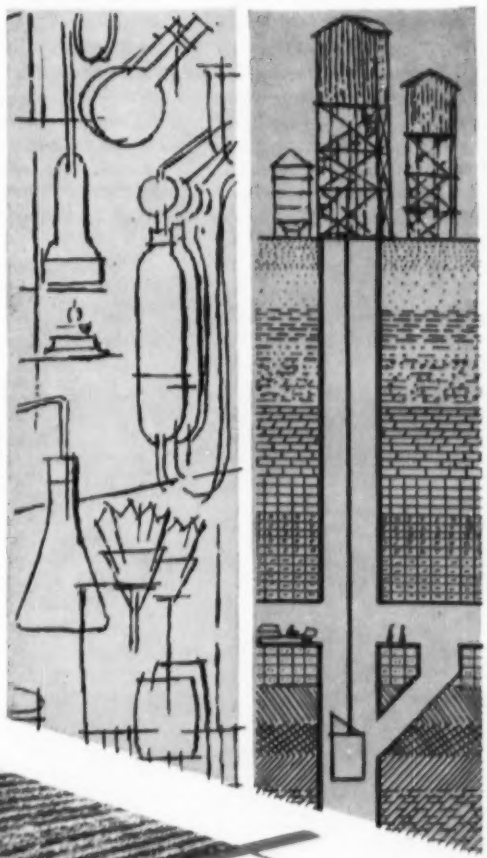
N.N.S. CHANGES NAME TO N.E.S.

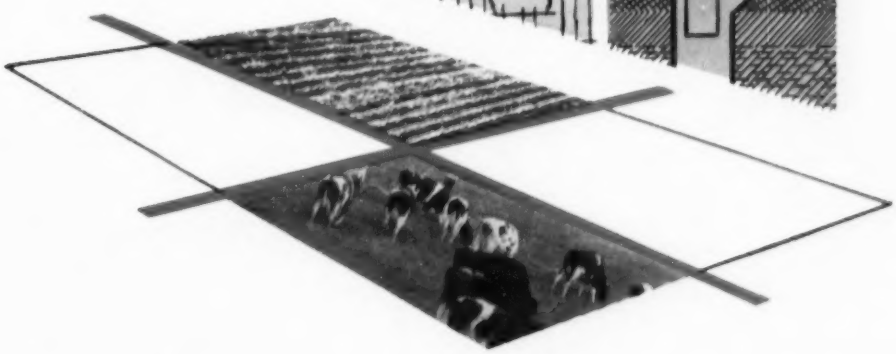
LOOK TO NATIONAL POTASH FOR QUALITY AND SERVICE

Backed by the skills and experience of its parent companies – Pittsburgh Consolidation Coal Company and Freeport Sulphur Company – NATIONAL POTASH offers important advantages as a dependable source of quality potash.

NATIONAL'S mining operations and refining processes will include the very latest industry techniques, and its storage and shipping facilities have been planned to meet efficiently the demand of the peak fertilizer season.

In addition, NATIONAL POTASH provides a free, comprehensive Technical Service to help manufacturers with granulation, formulation and other production problems. Write for complete information.





NATIONAL POTASH COMPANY
205 EAST 42nd ST. • NEW YORK 17, N.Y.

Fertilizer as a bargain, as a profit producer, and a cost cutter. He

best way to get these large increases on the market is to sell nitrogen

the amount of fertilizer he needs, and the kind he needs, and don't

N.N.S. CHANGES NAME TO N.F.S.

The National Nitrogen Solutions Association opened its second annual convention in Sioux City, Iowa, October 15-17, by approving a change in name to the National Fertilizer Solutions Association. **Wayne R. Johnson, Johnson Bros. Mills,** president of the former National Nitrogen Solutions Association, told the gathering that by joining forces the nitrogen solutions group and the liquid complete fertilizer fertilizer producers could work more effectively for their common interests.

John D. Waugh, director of advertising, Nitrogen Division, Allied Chemical & Dye Corp., in a talk on the effective use of advertising told of the program his company had pursued during a 3 year period to make the name Arcadian known to farmers in the mid-west. He outlined their philosophy of advertising, said it could be followed and adapted at the dealer level and gave these steps used in their own program: 1—settle on one brand name for all products; 2—make every effort to burn in that one name, make that name big and bold in all advertising, to always stand out and make a strong impression; 3—when you find a good theme, or ad, keep using it; 4—keep an experimental attitude to find the best means of doing the job.

Implementation at the dealer level is vital, he said; the dealer must act locally or producers can't stay in business. The dealer should use all the producers aids; if he knows his market he can use this material; the dealer should set a theme and pursue it in every selling effort—the profit theme, for example. (And for the best of reasons—adequate plant nutrient use is profitable. Also, the advertising value of gimmicks and stunts is good if not ridiculous.

Mr. Waugh said the future is with solutions, but it will necessitate getting the message over to the farmers, the 4-H Clubs, and developing new markets and new uses.

C. L. Taylor, field service manager, Michigan Bean Company, talked on promotional programs but opened with some comments about the hazards of getting into the business. He said that liquids offered a new business with live promotional opportunities and promise of expansion. But first must be figured the investment cost, personnel, and survey of market area to determine sales potential. Which doesn't account for farmer resistance, weather conditions, competition. Making a business work, he said, is quite different from working out a theoretical operating plan. There is new equipment to be handled; getting across the benefits of liquid fertilizer use and proof of it. Experience is a good teacher and you must have it to prove and settle your theories to a workable program. He believes progress will be made faster than most people think today but the programs must be tested and established.

Then he outlined some of his own company's program. Michigan Bean Co., he said, operates 24 elevators and 2 terminals. They had to look for storage and found what they believe to be the best engineered tanks obtainable; they are well located, give the impression of stability — that they are in business to stay, which is both good business in itself and good public relations.

Selling is not on a price basis but on an ease of handling basis. They use direct mail to 6 to 7,000 growers a few weeks before their needs, use newspapers, use pictures in advertising, use of institutional type of advertising to educate, use billboards in their own locality. Also promote at farmer meetings and get the growers to participate to give them their ideas—use the Doctor I. Q. type of program, ask questions and give a choice of 3 replies (set it up to make it easy). All of which gets a meeting off to a fast start. Half dollars go to the winners, cigars to the losers. They use slides to illustrate what's being accomplished elsewhere and in their own area. And last, they try to have fun at their meetings, avoid letting it get too serious as it develops more interest and more lasting interest. Then you clinch the sale at the farm.

Your program, said Mr. Taylor, should be centered on Joe Doaks, farmer; each farmer wants to feel that he is getting custom service—which is a good thing because a satisfied farmer will be your best salesman. Put a check plot in wherever you can to prove to the farmer that it can be done—it keeps him sold. And finally, work with the ag teachers, county agents, all groups that are already working to help you. And in particular keep in mind that your manager is the salesman on the firing line, the one who needs to know the basic selling information. So provide him with a loose leaf book divided into 4 sections, all about your product—methods of application—equipment—information on the products—the company's promotional program.

On the subject of production and use of fertilizer nitrogen, **W. R. Allstetter, vice-president, National Plant Food Institute, Washington, D. C.,** told the group that fertilizer is one of the really great bargains in agriculture today and said that the economic well being of agriculture and the fertilizer industry largely depend on how good a job is done on focusing attention on

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President: E. E. Crouse, CDK Liquid Fertilizer Corp., Liberty, Ind.; Vice President: Don Foster, Don Foster Nitrogen Solutions, Ottawa, O.; Treasurer: John White, Auburn Fertilizers Co., Auburn, Nebr.; Secretary: William B. Parrish, Auburn, Ill.

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Roy F. Broyhill (1957), The Broyhill Co., Dakota City, Nebr.; Richard Cecil (1958), Owensboro, Ky.; E. E. Crouse (1959), CDK Liquid Fertilizer Corp., Liberty, Ind.; Donald A. Fletcher (1959), Pacific Supply Cooperative, Ontario, Ore.; Don Foster (1957), Don Foster Nitrogen Solutions, Ottawa, O.; Ernest R. Harper (1959), Nitrogen Division, Allied Chemical & Dye Corp., Deland, Ill.; Wayne R. Johnson (1958), Johnson Bros. Mills, Inc., Shenandoah, Iowa; William B. Parrish (1959), Auburn, Ill.; W. Harold Schelm (1958), Schelm Bros., Inc., East Peoria, Ill.; Asa J. Schuler (1958), Welcome Agricultural Chemical Co., Welcome, Minn.; George H. Serviss (1957), G. L. F. Exchange, Soil Building Division, Ithaca, N. Y.; William B. Spargur (1957), Delavan Mfg. Company, West Des Moines, Ia.; F. Todd Tremblay (1959), Washington Cooperative Farmers Asso., Seattle 99, Wash.; Donald R. Webber (1959), Spraying Systems Co., Bellwood, Ill.; John White (1958), Auburn Fertilizer Co., Auburn, Nebr.; R. L. Wooley (1957), Wallace & Morley Company, Bay Port, Mich.

37 to 41% materials is in a form that

of the factors that built a successful

ing point Mr. Crouse brought out,

Fertilizer as a bargain, as a profit producer, and a cost cutter. He pointed out that there have been large increases in the consumption of nitrogen, phosphate and potash, and that top profits will result from the application of the major nutrients in proper balance as needed.

"The fertilizer industry has for many years tied its sales efforts closely to the work of state Agricultural Experiment Stations," he said. "This has meant the sale of those fertilizers best suited to the widely varying soils and crops in American agriculture. On most of the cropland in the US the application of two or three of the major plant nutrients is needed by growing crops."

Mr. Allstetter paid tribute to the nation's nitrogen producers for the magnificent job they have done in providing adequate quantities of this important plant nutrient for farmers, and pointed out that the best way to get these large increases on the market is to sell nitrogen in balance with other nutrients to get maximum results for farmers. He emphasized that proper fertilizer usage along with other recommended practices should be considered a means of cutting per unit costs of production, not as a means of creating surpluses. Fertilizer usage can mean more farm income from less total crop production.

Professor J. A. Stritzel, Extension Agronomist, Iowa State College, gave some good pointers on building customer confidence. First, start with the idea that you are in business to stay. If you are, you need repeat orders and must really serve your customers. To do this you must be aware of his needs and genuinely interested in him. You must find out what his needs are, then give him all the help you can. For the better you educate the farmer the better customer he makes. Sell him the amount of fertilizer he needs, and the kind he needs, and don't load him with stuff he can't use. Perhaps you can offer him a soil test or soil sampling service so you can sell him what he needs and not what you think he needs. The farmer's capital position should temper the fertilizer rate suggested. Adjust the rate to fit his capital position, and above all, remember to apply the proper balance of nutrients as indicated by good soil tests.

Stick to the facts, said Prof. Stritzel, don't sell the farmer on agronomic advantages that do not exist —for example, evaluate fertilizer-moisture relationships and adjust recommendations to the moisture supply. He cautioned that fertilizer isn't crop insurance against drouth if subsoil water isn't present.

He stressed doing a good job of application and the importance of a good seal on nitrogen solutions. He said that 37 to 52% of the N in the

1. Muriel F. Collie, exec.-sec'y., Chicago, president, E. E. Crouse, CDK Liquid Fertilizer Corp., Kitchel, Ind., retiring president, Wayne R. Johnson, Johnson Bros. Mills, Shenandoah, Ia.
2. O. C. Redenbacher; John Waugh, Nitrogen Division, Allied Chemical & Dye, New York City; C. L. Taylor, Michigan Bean Co.
3. Prof. C. J. Chapman, University of Wisconsin; Raoul Allstetter, NPFI, Washington, D. C.; Prof. J. A. Stritzel, Iowa State College.
4. Don Ross, Successful Farming; A. V. Slack, TVA.
5. Treasurer, John White, Auburn Fertilizers Co., Auburn, Neb.; E. E. Crouse; vice-president, Don Foster, Don Foster Nitrogen Solutions, Ottawa, Ohio.
6. John Dail, General Metals, Greensboro, N. C.; Merle Rassmussen, Beresford, S. Dak.

37 to 41% materials is in a form that could be lost if they were surface applied. He also pointed out the value of check strips—seeing is believing—said that because of soil variations fertilizer treatments and check strips should be repeated at least two, and preferably three or four times.

A. V. Slack, Chief, Program Development Staff, TVA, gave some of the problems in the progress of liquid complete fertilizers. He estimated that there are 80 to 90 bulk liquid mix plants in the central and eastern states with an average production of 1,000 to 2,000 tons per year, or a total of 80,000 to 175,000 tons in 1956. Although many plants have started up since early 1955 total production is very small compared to dry fertilizers. Low investment cost has contributed to increase in number of plants, lower total outlay versus dry, also power and labor costs are low. For $10,000 to $40,000 a liquid plant can be equipped for a 10 to 15 ton hourly capacity, according to Mr. Slack, (this figure does not include land, buildings, etc.) In California, where liquid mixed fertilizer has been most widely used, the ratio of liquid versus dry was 1 ton to 5 in 1955; this year at the end of the second quarter (ending June) showed a ratio of 1 to 3½ tons dry.

While the liquid mix plants do not have the dry plant problems of caking, reversion in storage, atmospheric polution, etc., they have some problems of their own, the main one being high cost of raw materials, and the chief trouble stemming from phosphate which is expensive because electric furnace phosphoric acid is the source. Green acid (wet process) altho' cheaper contains impurities which precipitate when ammoniated. Mr. Slack gave 4 approaches to using green acid. 1—If you ammoniate green acid get rid of impurities before it gets to the liquid mix plant. 2—Use a sequestering agent to prevent impurities from precipitating (he said that TVA is working now on a new phosphate product that shows promise). 3—Keep impurities in suspension by ammoniating as fast as you can (tests at TVA show good results but incomplete). 4—Settle the impurities and filter them out, which is effective but expensive.

E. E. Crouse, CDK Liquid Fertilizer Corp., in speaking on sales and promotion of liquid fertilizers told the group they had one thing to sell—service. Then he outlined some of the factors that built a successful operation. First on his list — you have to protect your dealers; have none closer than 8 miles; assure his profit of the difference between wholesale and retail price. Because he has a big investment in tanks and application equipment. You should keep close contact with your dealers, go with them to see hard to crack customers, be able to answer the farmers questions. If you can get a farmer to apply your product to half his area, you can make a friend and customer.

Adequate storage for raw materials is a must as is storage for finished products — farmers want their fertilizer now and cannot wait. And here's another interesting point Mr. Crouse brought out, he recommended that the farmer apply his own fertilizer because he can do a better job on his own land. Color slides help to show farmers simple types of spreaders and mentioned a 10 ft. spreader as being especially useful. He suggested helping farmers convert corn planters and wheat drills to liquid; certainly help your customers find the right application equipment. And recommended using farmer meetings to get across the advantages of liquid use.

The National Fertilizer Solutions Association will hold their next annual meeting between Oct. 15 and Nov. 1, 1957, the exact date and location will be announced soon.

Warns of Advertising Abuses

Sigurd Anderson, Commissioner, Federal Trade Commission, Washington, D. C., at the New Jersey Fertilizer Conference at Rutgers University Sept. 27, said that "extravagant claims" for fertilizers and soil conditioners "find ready and willing victims" and warned that "it is the public not versed in the true qualities of a product, falsely advertised, that the Federal Trade Commission must protect."

Speaking on "Modern Advertising —Uses and Abuses," the FTC Commissioner emphasized that "there is a greater protecting force than the Federal Trade Commission that should operate in this field, and that is the advertising conscience of the producer of the product offered for sale."

"As you know," he said, "the Federal Trade Commission has shown considerable interest in the fertilizer industry and its allied branches in addition to the cases brought against those who have violated the Federal Trade Commission Act."

Commissioner Anderson said that "19 complaints have been brought against members of the industry and that 19 stipulations have been secured from the members of the industry, making a total of 38 cases."

"In connection with the complaints," he said, "orders to cease and desist were taken against 9 of the 19 respondents complained against; 7 cases were dismissed; and there are 3 complaints pending."

"Considering the great size and importance of your (fertilizer) industry, it can be said that your 'clean advertising' record is good."

He cited many examples of fertilizer and soil conditioner products that have required Federal Trade Commission attention. He pointed to examples as follows:

"That application of _____ will cause plants to grow under any circumstances other than the lack of fertilizer;

"That other fertilizers or plant foods will not produce as satisfactory results as _____;

"That dry fertilizers do not provide a balanced diet to plants;

"That a fertilizer must be applied in liquid form in order that plants may utilize the ingredients;

"That _____ causes grass to germinate in a shorter time than all other commercial fertilizers."

Commissioner Anderson said that "most of the cases that we have at the Federal Trade Commission are the result of complaints made by competitors of wrongdoers." He emphasized that "any person who feels that a businessman, whether his competitor or not, is guilty of unfair methods of competition and unfair or deceptive acts or practices in commerce, may complain to the Commission." He emphasized that "any person or corporation that makes a complaint will have no fear of having a disclosure made."

"Complete anonymity will be maintained concerning the party making a complaint," he said. "In this manner, the party making the complaint will be safe from reprisal and revenge."

"The complaint may be submitted in any form," he said. "The complaint may be by letter or by personal contact with the Commission."

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TRONA® POTASH *for Agriculture*

In 1917 state fairs were awarding prizes for outstanding farm products just as they are today. Then as now, growers depended on Trona® MURIATE OF POTASH for high quality crops. For it was in 1917 that Trona, first to produce domestic Potash when World War I pinched off foreign sources, shipped the first trainload to the east coast. Since that time, even with American Potash and Chemical Corporation's broad diversification program, Trona is still one of the primary basic suppliers of high grade Muriate and Sulphate of Potash for Agriculture.

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—and a diversified line of specialized agricultural and refrigerant chemicals

MURIATE of POTASH, agricultural grades 95-98% KCl, (60% K_2O minimum), regular and granular.
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Plants • Trona and Los Angeles, California; Henderson, Nevada
San Antonio, Texas (American Lithium Chemicals, Inc.)

Export Division • 99 Park Avenue, New York 16, New York

Middle West Soil Group Elects Bennett

Plans for expanded educational activities to help promote greater use of fertilizer in the Corn Belt were discussed at the Middle West Soil Improvement Committee's 18th annual meeting at Hotel Sherman, Chicago, Oct. 25. In attendance were more than 250 executives and sales personnel representing 75 fertilizer companies and organizations throughout the Middle West and other U.S. areas.

R. E. Bennett, Farm Fertilizers, Inc., Omaha, Nebr., was elected president for the 1956-57 term; other officers: Robert G. Fitzgerald, Smith-Douglass Co., Inc., Streator, Ill., vice president, and L. E. Quiram, Illinois Farm Supply Co., Chicago, Ill., treasurer.

Directors elected were: R. E. Bennett; Marshall Smith, Smith Agricultural Chemical Co., Columbus, O.; R. G. Fitzgerald, Smith-Douglass Co., Inc., Streator, Ill.; Merle Blue, Consumers Cooperative Association, Kansas City, Mo.; W. W. Venable, Cornland Plant Foods, Grinnell, Iowa, was elected a director to fill a vacancy on the board.

Earl L. Butz, assistant secretary of agriculture, was the principal speaker. On the agenda of the business meeting were reports by MWSIC Treasurer G. H. Kingsbury, of Kingsbury & Co., Indianapolis; and C. R. Sparks, chairman of the audit committee.

Z. H. Beers, MWSIC executive secretary, reported on the results of the committee's 1955-1956 educational program and discussed plans for 1957. He said the committee had maintained its high batting average on publicity in 1,700 daily and weekly newspapers. Radio coverage of MWSIC farm scripts was increased 25 per cent during the year, with 357 Corn Belt stations now regularly carrying information on fertilizer value in boosting farm profits. National, regional and state farm magazines reaching a circulation of 4,000,000 farm families published 21 MWSIC articles during the year. The fertilizer industry trade press cooperated strongly with the committee, covering meetings and giving generous editorial attention to various MWSIC activities, Mr. Beers said.

Visual education work was stepped up during the year, with the completion of two new filmstrips—"Growing Profitable Alfalfa" and "Band Seeding for Higher Profits." These have been distributed to schools for use by Vocational Agriculture classes and to county agents for farmer meetings. Work is being undertaken on additional filmstrips for 1957 release. Subjects may include: Soil Sampling and Fertilizer Recommendations; What Makes a Good Soil; Fertilizer Response in Wisconsin; Plant Nutrient Deficiency Signs; Diagnostic Techniques in the Field.

Designed to help spur fall fertilizer sales, 200,000 copies of a new MWSIC folder entitled "Fertilize This Fall — Save Time, Money, Work" were distributed to dealers and farmers, and also to colleges and county agents, via MWSIC member companies. Also distributed were 300,000 copies of the color folder "Growing Profitable Alfalfa"; and 50,000 copies of "Signs That Show on Hungry Legumes."

A new slide set service for TV stations has been launched, the secretary reported. These cover a variety of subjects dealing with profitable fertilizer use. Fertilizer research and demonstrations by Midwestern agricultural colleges under MWSIC grants-in-aid are developing a valuable body of new information, Beers said.

Turning to the future, Mr. Beers cited the need for more educational, public relations and research work to encourage farmers to help build the tonnage of fertilizer toward the total usage for which there is a potential in the Corn Belt.

MWSIC members approved a budget for 1956-57 educational activities.

Other items on the business meeting program included reports of the membership committee, headed by J. D. Stewart, Federal Chemical Co.; the literature and filmstrip committee of which D. A. Williams is chairman; the fertilizer research committee, headed by L. E. Quiram, of Illinois Farm Supply, and the fertilizer demonstration committee, headed by A. R. Mullin, Indiana Farm Bureau Cooperative Assn.

A visual education session during the afternoon was devoted to a showing of TV slide set sequences, and to a preview of new color film strips, by C. E. Trunkey, MWSIC assistant secretary.

YOUR BALANCE IN THE SOIL BANK

Summary of remarks by Earl L. Butz, Assistant Secretary of Agriculture, before the Middle West Soil Improvement Committee.

The Soil Bank will probably have a double-headed effect on fertilizer consumption. To the extent that the acreage reserve reduces acres in basic crops, all of which are relatively heavy fertilizer users, it is inevitable that it will have a negative influence on fertilizer consumption. On the other hand, it is entirely probable that farmers will intensify fertilizer usage on the remaining acres in basic crops as well as on land devoted to other crops. Moreover, new seedings on the conservation reserve acres will use additional quantities of fertilizer.

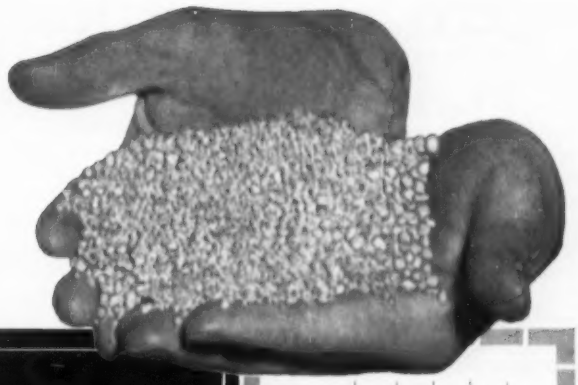
Based on the expected variation in acreage reserve participation by regions, assumed reductions of basic crops might have a maximum negative impact on fertilizer consumption as shown below.

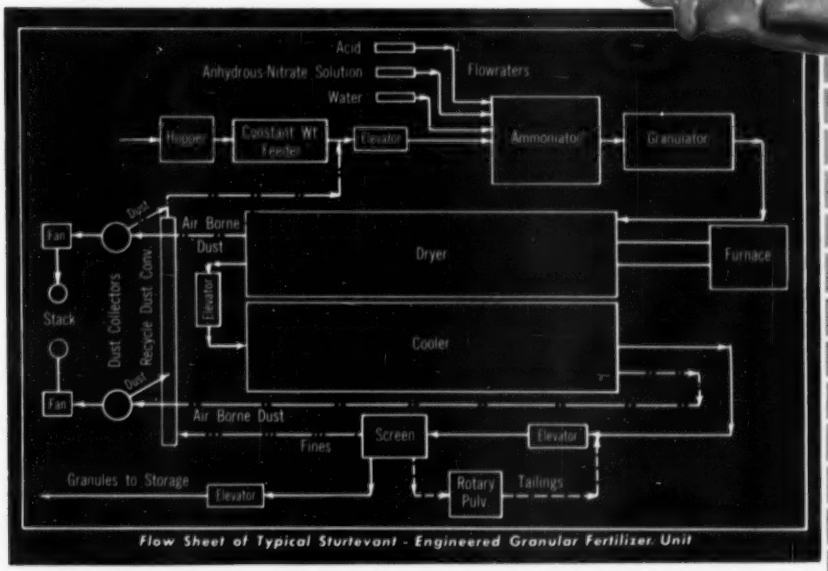
The above-described maximum negative effect on fertilizer consumption would be offset somewhat by higher rates of fertilization on land remaining in basic crops and on land devoted to other crops. The net negative effect of the Acreage Reserve Program on fertilizer consumption might be as little as 400 thousand tons.

The conservation reserve effect on fertilizer consumption must take

Crop	Assumed Acreage Reduction	Fertilizer Applied Per Acre	Indicated Fertilizer Tonnage Reduction
Wheat	13.0 million	20	130,000
Corn	5.0 million	100	250,000
Cotton	4.0 million	200	400,000
Rice	.2 million	250	25,000
Peanuts	.15 million	400	60,000
Tobacco	.10 million	1300	65,000
U. S	22.45 million	85	930,000

Granular Fertilizer Can Be in Your Future, too!





Flow Sheet of Typical Sturtevant - Engineered Granular Fertilizer Unit

LET STURTEVANT ENGINEERING AND EQUIPMENT MAKE THIS YOUR GRANULAR FERTILIZER UNIT

If you operate a mixing plant, there's a granulator in your future. The signs are unmistakable. Granular fertilizer is replacing its powdered cousin faster than modern processors can keep up with the demand.

Take the case of Canada Packers, Limited, of St. John, New Brunswick. Fourteen months after Sturtevant engineers assisted in adapting this customer's plant to a granular product, the balance of orders had shifted to 70% granular against 30% powder — *and management expects in a very short time (perhaps as you read this) that shipments will be 100% granular.*

Of course, we at Sturtevant Mill Co. are not market authorities, although we do believe this experience by Canada Packers, Limited is significant.

Our business is to assist you with the designing and engineering of the best possible granular fertilizer unit for your needs — also super phosphate units and conventional mixing units, according to your requirements.

Serving the fertilizer industry has been our business since 1873 . . . which is why you won't get rash promises or rush engineering when you come to Sturtevant. You will get a unit that will produce *what* it's supposed to *when* it's supposed to.

Why not let Sturtevant help you to spell out *your* future in granular fertilizers by writing today? Use the convenient coupon on the right.

STURTEVANT

Dry Processing Equipment

The "OPEN DOOR" to *lower* operating costs over *more* years

PULVERIZERS • CRUSHERS • MICRON-GRINDERS • GRANULATORS • SEPARATORS
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MECHANICAL DEN & EXCAVATORS

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Also bulletins on Sturtevant machines for:

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I am interested in a new unit ☐ conversion ☐

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Name _____ Title _____

Firm _____

Street _____

City _____ Zone _____ State _____

into consideration the fact that new seedings cannot ordinarily be grazed or cut for hay. Therefore, both the rate of seeding and amount of fertilizer applied per acre will be less than on ordinary hay and pasture land. Assuming new seedings on about 12 million acres of 1957 conservation reserve land, an average rate of 125 pounds of fertilizer per acre might be expected. This would provide a market for 750 thousand tons, which would decrease in future years as more funds are committed for annual payments for conservation reserve acreage previously contracted, and with compensatingly smaller funds available for conservation practices.

Total Fertilizer Usage Will Increase

It is at once apparent that if you put together the contemplated reduction of 400,000 tons of fertilizer because of the Acreage Reserve Program, and the added 750,000 tons because of the Conservation Reserve Program, you come out with a net increase of 350,000 tons. This estimate is, of course, highly speculative, as any estimate must be at this early date. It is a national estimate and of course does not allow for local or regional varieties.

It should be emphasized that participation in the Soil Bank is entirely voluntary on the part of each individual producer. He may go into it or stay out as he sees fit. He may use the payments he gets for participation in the acreage reserve any way he sees fit. Many farmers will choose to intensify fertilizer application on the remaining acres in production.

Some persons will argue that to the extent that farmers do this the Soil Bank will be self-defeating. Others will argue, with considerable conviction, that it is never self-defeating for farmers to apply science and technology, to lower unit costs, and to increase efficiency, so long as this practice is combined with realistic pricing programs and effective promotion which move the bounty of our production into effective use rather than into government warehouses and bins.

The acreage reserve feature of the Soil Bank was never conceived as a permanent program. It should be operative only long enough to effect a desirable balance between production and consumption. If during this interim progress can be made in the adoption of a farm program with sufficient flexibility to permit a dynamic agriculture to adjust to changing supply and demand situations, it is possible that our agriculture may once again move forward without the strangling effects of unmanageable surpluses and free from the deadening hand of bureaucratic restriction.

Under these conditions the American farmer—the most scientific and the most efficient farmer in the world—should be able to regain his rightful place as a low-cost producer of food and fiber for a growing market both at home and abroad.

And when the opportunity to produce need no longer be curtailed by Federal regulation, the American farmer should see his income prospects considerably brightened. For after all, income is the product of production times price—not price alone.

And it's income that we spend—not price.

BULLETINS

Renneburg Offers Granulation Bulletin

Edw. Renneburg & Sons Company, Baltimore, Md., has just released a new 12-page bulletin describing its continuous granular fertilizer processing equipment. The bulletin covers ammoniators, granulators, continuous combination ammoniator-granulators, dryer furnaces, dryers, coolers, combination dryers and coolers, air handling systems and pilot plant equipment. Included are equipment photographs, plant shots and detailed drawings. There is also a layout of a fertilizer plant using typical Renneburg equipment and a granular fertilizer unit flow sheet. The bulletin is currently available from Edw. Renneburg & Sons Company, 2639 Boston St., Baltimore 24, Md.

Calumet Presents New Copper Oxide Booklet

The Calumet division of Calumet & Hecla, Inc., announces a new booklet on "Calumet Brown Copper Oxide—Fertilizer Grade," for the agricultural market.

The booklet on concentrated source of copper for fertilizer mixtures and direct soil applications describes Brown Copper Oxide in detail and shows where and how it can be used most economically. It also highlights the research and experimental programs carried on its behalf.

Further information may be obtained by writing the Calumet Division of Calumet & Hecla, Inc., 3 Calumet Ave., Calumet, Mich.

Pennsalt Offers Bulletins To Farmers

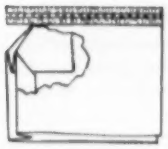
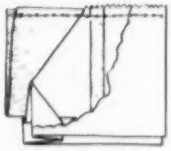
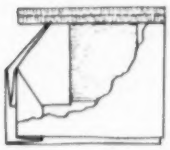
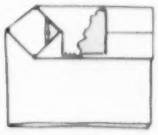
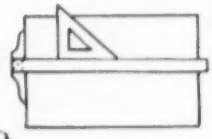
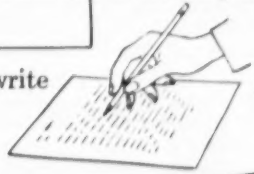
A series of bulletins covering a wide variety of agricultural subjects of interest to farmers in New York, New Jersey, Pennsylvania and Delaware, is being offered by the I. P. Thomas division of Pennsalt Chemicals.

The first series of three Farm Service Bulletins, "Soil Sampling for Soil Tests," "Granular or Pelletized Fertilizers," and "Organic Matter," is now available to farmers, agents and dealers on request from the I. P. Thomas Division, Dept. B, Pennsalt Chemicals, 3 Penn Center Plaza, Philadelphia 2, Pa.

INDUSTRY CALENDAR

Date	Organization	Place	City
Nov. 11-13	Calif. Fert. Assn.	Del Coronado	Coronado, Cal.
Nov. 27-28	Indiana Fert. Conf.	Memorial Union Bldg. Perdue Univ.	Lafayette, Ind.
Nov. 28	Okla. Fert. Dealers Conf.	Okla. A&M College	Stillwater, Okla.
Nov. 29	Okla. Sales & Crops Conf.	Okla. A&M College	Stillwater, Okla.
Dec. 10-12	No. Central Weed	Sherman Hotel	Chicago, Ill.
Dec. 12	Amer. Soc. Ag. Engr.	Edgewater Beach	Chicago, Ill.
		1957	
Jan. 8-9	Texas Fert. Conf.	MSC	
Jan. 23-25	Sou. Weed Conf.	Bon Aire	Augusta, Ga.
Feb. 14-15	Middle West Soil	Edgewater Beach	Chicago, Ill.
June 9-12	NPFI	The Greenbrier	White Sulphur Springs, W. Va.
July 10-14	Plant Food Producers of Eastern Canada	Manoir Richelieu	Murray Bay
July 17-19	SW Fert. Conf.	Galvez Hotel	Galveston, Texas

LOOK what Fulton can do for you with a paper bag!

Fulton's sewn multiwall bags can be ordered with regular valve,  a creped tuck-in sleeve  or a variety of inner sleeves such as the superior Ful-Flex®.  In pasted multiwall bags you get a choice of valves with or without inserts and extensions.  You may specify printing on any paper bag in non-skid, non-rub Ful-Grip Ink (at no extra charge) permitting higher stacking without slipping. Ful-Flex® Elastic Multiwalls—low-cost replacements for rigid containers— have three to five plies of tough crinkled paper . . . can be moisture-proofed with a special barrier ply . . . are strong, easy to handle, convenient to store. WPPL (Water Proof Paper Lined) textile bags with paper or polyethylene laminations keep out dampness, retain proper moisture inside. Or if you have other difficult packaging problems, Fulton's Special Services Division will assist  in developing a package that suits you perfectly. Just call or write  your nearest Fulton branch today.

Fulton
BAG & COTTON MILLS

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LOS ANGELES • MINNEAPOLIS • NEW ORLEANS • NEW YORK • OKLAHOMA CITY
PHOENIX • ST. LOUIS • SAN FRANCISCO • SAVANNAH • WINTER HAVEN

CHANGES

Arkell & Smiths have purchased the bag-making equipment and plates of the **Thomas Phillips Company** at Akron, Ohio, it was announced by **Sheldon Y. Carnes,** vice president & general sales manager of Arkell & Smiths.

A & S has leased the Thomas Phillips bag factory and will operate this plant in addition to their four bag plants at Wellsburg, W. Va.; Canajoharie, New York; Hudson Falls, New York; and Mobile, Ala.

* * *

Canadian Industries Limited has purchased **Witts Fertilizer Works Limited,** founded in Norwich, Ontario more than 45 years ago as manufacturers of compound fertilizers.

The announcement was made by the president of Witts Fertilizer, **Frederick C. Bishop,** who is retiring along with **Charles F. Bishop,** vice president and general manager.

Mr. Bishop stated that all other personnel are remaining with the business, which in future will be known as **Witts Fertilizer Company.**

* * *

Ralph B. Douglass, president of **Smith-Douglass Company, Incorporated,** announced Oct. 5 that the United States District Court for the Southern District of Texas has agreed to a reorganization petition for **Texas City Chemicals, Inc.,** based on a plan submitted by Smith-Douglass. The plan provides that Smith-Douglass reopen and operate the plant of Texas City Chemicals as agent for the Court's Trustee, and that Smith-Douglass participate in the reorganization proceedings on a basis which would result in its becoming the controlling stockholder of Texas City Chemicals when and if a reorganization plan is consummated. Mr. Douglass said that the Smith-Douglass plan had been tentatively accepted by a number of the creditors of Texas City Chemicals.

Texas City Chemicals, Inc., completed a large dicalcium phosphate plant at Texas City, Texas, in 1954. The company encountered financial difficulties shortly after the plant was completed, which resulted in the closing down of operations in January 1956. It has facilities for producing sulphuric acid and phosphoric acid, in addition to dicalcium phosphate.

Smith-Douglass now operates the **San Jacinto Chemical Co.,** an anhydrous ammonia plant, near Houston, Texas. Texas City is just outside Houston.

Smith-Douglass personnel flew to Texas City early last month to commence plant start-up operations. **Dale C. Kieffer,** technical director, will be in overall charge of production, assisted by **W. O. Johnson** and **Howard C. Hendron. Herbert Britain,** home office budget section supervisor, has been transferred to establish a financial section.

Smith-Douglass now operates eleven plants in ten cities, producing fertilizer, ammonia, phosphate products, and natural organic nitrogen.

* * *

Purchase of **William Stone Sons Limited,** of Ingersoll, Ontario, by Canadian Industries Limited was announced at Ingersoll by **F. H. Stone,** retiring president of the company. Products of the firm, which has been dealing with the agricultural industry in southwestern Ontario for more than 80 years, include fertilizers, feed and hides. It also has extensive rendering operations.

According to **V. B. Lillie,** new president of William Stone Sons Ltd., who is also general manager of C-I-L's agricultural chemicals division, the transfer of ownership will result in no change in either the company name or its general policy.

* * *

Separate sales sections for agricultural chemicals and for industrial chemicals have been organized within the sales department of **Monsanto Chemical Company's** inorganic chemicals division.

The move is the result of consolidation in the division for sales and research on nitrogen products, previously handled by the **Lion Oil Company division.**

In the agricultural sales section, **S. R. Clement** has been appointed director of sales, and **Leroy Donald** has been appointed director of sales development, both with offices in St. Louis. Two assistant directors of agricultural sales also were appointed: **Bernard Machen,** in charge of district offices, and **R. W. Goldthwaite,** in charge of agricultural products. **M. F. Walsh** was appointed manager of product sales and **Roy Spence** was named manager for direct application of ammonia products.

Paul J. Talley will report to Mr. Donald as chief agriculturalist as will **R. N. Lassiter** as manager of agricultural technical service.

The new alignment in the division's research department to back up increased agricultural activity includes four research groups under **Dr. Marion D. Barnes** as assistant research director.

All of the groups will be centralized in the division's new research building in St. Louis County upon completion next spring.

Dr. J. G. Stites has been appointed group leader for fertilizer materials study. The group is concerned principally with research on company products sold as raw materials to the fertilizer manufacturing industry.

Dr. L. E. Loveless heads a group concerned principally with plant and animal nutrition. Another group headed by **A. P. Wood** is responsible for fertilizer analytical work. The fourth agricultural research group, headed by **Robert T. Webber,** is charged with developing plant food processing data for its fertilizer manufacturing customers.

* * *

Officials of **Fulton Bag & Cotton Mills** announce the consolidation of its St. Louis textile manufacturing operations along with the expansion of the Kansas City branch plant and Chicago sales office.

In line with the Company's modernization program to improve manufacturing efficiency, Jason M. Elsas, Vice President and General Manager, Fulton's Bag Division, New Orleans, said the obsolete, multi-storied textile bag plant in downtown St. Louis will be closed. Sales headquarters for textile, multiwall paper bags and other Fulton products will be housed in its modern, single-storied multiwall plant at 4501 Gustine Avenue in St. Louis. All operations of the St. Louis textile bag plant will be absorbed, principally by Fulton's Kansas City plant.

* * *

United States Borax & Chemical Corporation announces opening of a new office in Portland, Oregon to handle development and sales of plant food borates in the Pacific Northwest. According to **James A. Naftel,** manager of the plant food department of the **Pacific Coast Borax Company division, Glen L. Holt** has been assigned to this new office

and is already operating in this area. With the establishment of this office in the Pacific Northwest, all activities in the development and sales of plant food borates will be handled by the Plant Food Department.

* * *

Opening of a San Francisco warehouse at 1862 Rollins Road, Burlingame, California has been announced by **The Jeffrey Manufacturing Company,** Columbus, O. The building also houses the Jeffrey San Francisco sales headquarters, formerly located at 870 Market Street, San Francisco.

Stanley M. Mercier is manager of San Francisco sales headquarters; **William T. Davis** serves as application engineer, and **Henry G. Neubaumer** is warehouse manager.

* * *

Expansion of the **Chase Bag Company** branch in Portland, Oregon, has been announced by **J. A. Brewster,** manager.

A new building covering approximately 25,000 square feet is under construction on property adjoining the present Chase Bag plant at 2550 N. W. Nicolai Street in Portland, built in 1939.

* * *

Nitrogen Division, Allied Chemical & Dye Corporation, has opened a district sales office in Raleigh, N. C. Located at 606 Capital Club Building, the new office is under direction of **John H. Ritter.**

With opening of the new office, Mr. Ritter was promoted to direct application materials sales manager for the state of North Carolina. He was formerly a salesman covering the southeast part of the state, joining Allied Chemical in 1940.

* * *

Faesy & Besthoff, Inc., has moved its offices to new and larger quarters at 25 East 26th Street, New York 10, N. Y. Telephone number is MUrray Hill 4-2700.

* * *

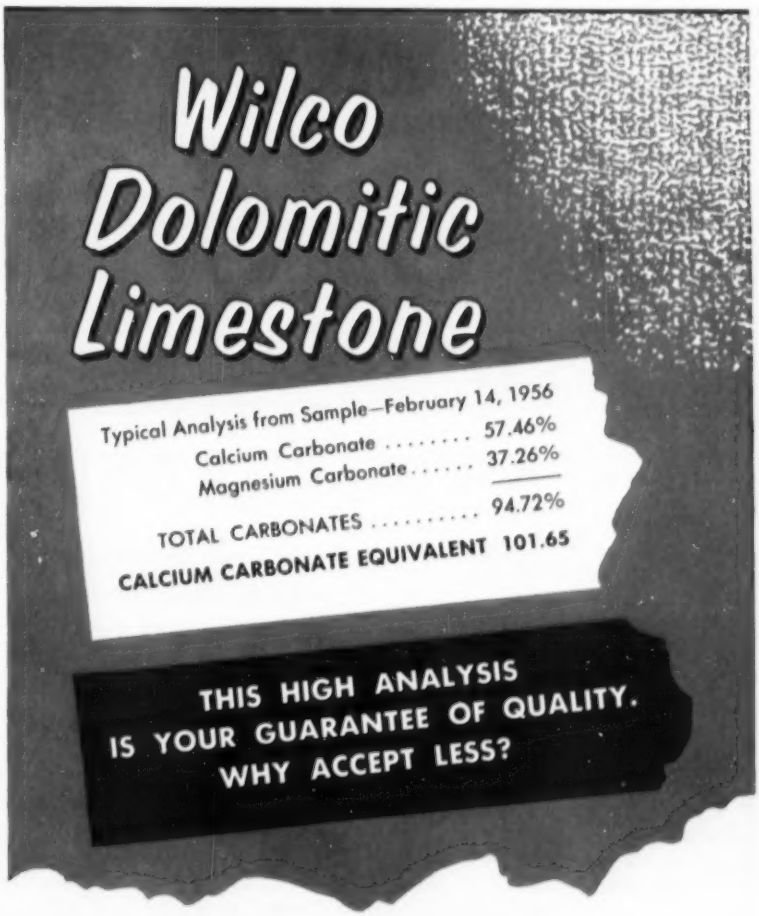
Schutte Pulverizer Co., Inc. has moved into a newly purchased building with more than 50% increased manufacturing and office area, it was announced by **Herman D. Schutte,** president. New headquarters for the company will be at 878 Bailey Avenue, Buffalo 6, New York.

* * *

Miller Chemical & Fertilizer Corporation, Baltimore, Md., manufacturer of agricultural fertilizers and pesticides, has acquired the **Lancaster Bone Fertilizer Company** plant at Ephrata, Pa. This acquisition of the Ephrata location gives Miller an additional manufacturing and distributing point for dry and liquid fertilizers, insecticides, fungicides, and weedkillers in Eastern Pennsylvania. Miller plans to enlarge and modernize the present facilities at Ephrata to better serve its growing business in this area. Miller will have a sales office at the Ephrata plant.

Miller is an old concern which has been diong business in Eastern Pennsylvania for many years from their plants at Hanover, Pa.; Whiteford, Md.; and Baltimore, Md. Other Miller plants are located at Salisbury, Md., and Gaithersburg, Md. They produce a wide variety of chemicals for agriculture. They also produce related products used by home gardeners. Their products are distributed throughout the East.

In addition to the Ephrata facilities, Miller recently has established a warehouse for pesticides at the new **P. L. Rohrer & Bro. Co.** warehouse at Smoketown, Pa. Sales from both points will be directed by **O. Neuman, Jr.,** Miller vice president, with the help of **Theodore N. Minnich,** who was associated with the Lancaster Bone Fertilizer Company for many years, and **Elwood K. Funk,** who has been with Miller for some time.



WILLINGHAM-LITTLE STONE COMPANY

1323 Fulton National Bank Building

Atlanta, Georgia

Phone JAckson 3-5591

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serving the south's fertilizer industry for more than 40 years

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Established in 1834

All Steel Self-Contained Fertilizer Mixing and Bagging Units

Complete Granulating Plants

Batch Mixers—Dry Batching

Pan Mixers—Wet Mixing

Tailings Pulverizers—Swing Hammer and Cage Type

Dust Weigh Hoppers

Vibrating Screens

Acid Weigh Scales

Belt Conveyors—Stationary and Shuttle Types

Batching Systems

Bucket Elevators

Hoppers and Chutes

STEDMAN FOUNDRY & MACHINE COMPANY, INC.
Subsidiary of United Engineering and Foundry Company
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AMMONIATES — FEED STUFFS — SULPHUR — POTASH
INDUSTRIAL AND AGRICULTURAL
CHEMICALS

CF Staff-Tabulated TONNAGE REPORTS

FERTILIZER TONNAGE REPORT (in equivalent short tons) Compiled by Cooperating State Control Officials and Tabulated by COMMERCIAL FERTILIZER Staff

STATE	September		August		July-Sept. Qtr.		January-June		July-December		YEAR (July-June)	
	1956	1955	1956	1955	1956	1955	1956	1955	1955	1954	1955-56	1954-55
Alabama	35,418	30,213	21,546	17,390	73,427	62,490	813,104	846,735	167,372	272,068	1,029,030	1,114,238
Arkansas	13,652	16,586	7,635	7,419	33,156	33,567	299,172	270,894	60,299	59,997	359,471	330,781
Georgia	18,884	13,340	19,487	16,226	84,808	80,739	993,954	1,047,875	250,968	225,083	1,244,422	1,273,445
Kentucky	.....	17,130[1]	12,294	11,078	.....	33,388[1]	441,481	431,024	88,119	91,386	529,600	522,410
Louisiana	10,324	12,007	5,974	3,954	24,150	22,849	214,343	232,781	59,345	78,067	273,688	310,848
Missouri	.....	105,139[1]	.....	47,430[1]	.....	164,002[1]	450,102	414,503	360,210	268,257	804,441	682,690
N. Carolina	.....	34,182[1]	21,024	15,575	.....	62,174[1]	1,424,267	1,566,158	225,182	264,475	1,649,449	1,830,633
Oklahoma	11,824	27,295	9,946	9,629	25,166	40,347	65,854	63,799	69,542	58,405	135,396	122,204
S. Carolina	18,344	18,144	11,911	11,866	43,019	41,355	743,670	796,111	119,947	132,604	863,617	928,715
Tennessee	21,110	21,441	12,559	11,817	58,205	59,120	378,676	355,966	136,925	167,383	515,551	523,349
Texas	32,779	42,850	14,458	12,588	71,436	76,141	377,805	375,176	188,594	212,885	566,399	588,062
California	(reports compiled quarterly)				.....	173,411[1]	639,377	603,657	361,615	318,270	1,001,554	922,127
Indiana	(reports compiled semi-annually)						807,918	873,966	242,530	284,994	1,063,049	1,158,960
Iowa	(reports compiled semi-annually)						231,873[1]	.....	.....	.....	.....	.....
N. Hampshire	(reports compiled semi-annually)						13,168[1]	.....	.....	.....	.....	.....
Washington	(reports compiled semi-annually)						103,288	124,186	48,749	58,162	152,037	182,348
TOTAL	162,355	181,876	136,744	117,542	413,367	416,608	7,753,011	8,002,921	2,379,397	2,492,036	10,187,704	10,490,810

.....(not yet reported) * Not compiled [1] Omitted from column total to allow comparison with some period of current year.

MARKETS

ORGANICS: Movement for organic fertilizer materials is tending upward as mixing operations increase particularly in the Southeast. Leather Nitrogenous Tankage is in comfortable sales position at prices ranging from $3.00 to $4.25 per unit of Ammonia f.o.b. production point.

Activated Sludge prices are steady at $2.95 per unit of Ammonia and 50c per unit of APA, bulk, f.o.b. Midwest production point, with another production in the Southwest currently at $3.00 per unit of Nitrogen and 50c per unit of APA, bulk.

CASTOR POMACE: Movement is entirely against previous contract commitments. Bids of $37.50 are currently declined for lack of supplies of material although some limited tonnage was sold early October at $37.50 f.o.b. Northeastern production point, in bags.

DRIED BLOOD: In the Chicago area unground sacked Blood is indicated at $4.75 to $5.00 per unit of Ammonia. The New York market is nominal at $4.50.

POTASH: Demand is seasonal and prices steady with movement tending to improve.

GROUND COTTON BUR ASH: Supplies are currently tight for this source of Potash which is primarily in the form of Carbonate of Potash. Further supplies are expected to be available the latter part of December through the balance of the season. Current analyses vary from 35% to 42% K20.

SUPERPHOSPHATE: Movement of this material is in seasonal dimensions with supplies in comfortable position and prices steady.

PHOSPHATE ROCK: Prices continue firm with movement improving and stocks comfortable at the mines.

NITRATE OF SODA: Effective October 1st, imported Nitrate of Soda was reduced in price by $1.75 per ton from previous levels. Current price f.o.b. cars at Atlantic and Gulf ports is $46.00 per ton, bulk and $49.50 per ton in bags, carlot quantities or $52.50 per ton bulk and $56.00 per ton bagged delivered to rail destinations east of the Rocky Mountains. There has been no change in f.o.b. production point prices for domestic Nitrate of Soda. Movement is in seasonal dimension.

SULPHATE OF AMMONIA: Prices continue at $32.00 per ton at most mills with some Southwestern mills quoting $31.00 bulk and Midwestern mills $34.00 with delivered price and freight equalized.

GENERAL: Manufacturing activity, particularly in the Florida area, is rapidly increasing as demand from farmers for mixed goods grows. Some manufacturers are concerned about the serious box-car shortage which is likely to be aggravated seriously by the drop in the water level of the Mississippi River. There is a threat of curtailment of barge movement down the Mississippi which will mean heavier demand for rail cars which will affect all types of materials as well as fertilizer materials.

Slide Rule Device Offered By St. Regis

A paper selector for multiwall paper bags, in a convenient slide rule form for easy reference, has been designed by St. Regis Paper Company. With the selector, it is possible to determine the type of paper best suited to meet individual multiwall bag packaging requirements.

Information is provided on such topics as the type of protection offered by multiwall bag papers, the properties of multiwall bag papers, a description of the various types of papers and a representative list of the products using particular plies. By utilizing the slide rule, it is possible to select any multiwall bag paper and quickly find its properties, a description of its construction, and its present product packaging applications.

The selector indicates which papers will provide protection against grease and oil, acid and alkali, scuff and abrasion, bacteria and insects, moisture vapor and water damage.

St. Regis recently prepared a multiwall bag papers manual which contained samples and descriptions of each type of paper used in multiwall bags. The Multiwall Paper Selector provides a quick, easy condensation of this information.

FARMERS MIGHTY WELL OFF GRAIN MAN'S BULLETIN SAYS

Now tht the election is over we can print, without seeming to propagandize, the following which was taken from the Daily Market Letter of the Uhlmann Grain Company, Chicago:

In a political year, such as this, a great deal is said about agriculture by both parties, and we are getting considerable comment on the fact that farmers are not in all cases receiving parity. As we have mentioned so often, the comparisons that are being made are not accurate because parity does not take into account modern technology. Actually agriculture has made more progress during the past 50 years than it did in all prior recorded history. Experts believe that if current trends continue agriculture may make more progress during the next 15 years than it has during the past 50. This writer recalls that even 40 years ago many farmers did not even permit themselves the luxury of sugar. Almost everything that was eaten or worn came from the food and fiber that was grown nearby. Today the situation is completely different.

The new balance sheet which was recently published by the Federal Reserve Board shows that a new high in assets for farmers has been reached; namely, 170 billion. The increase for this year alone was $3.5 billion. Today we find a record high number of farms that have both electricity and telephones, and generally speaking farm families have never had a higher standard of living. Farm output today is 75% greater than it was in 1910, and this is being accomplished by fewer people on farms. Through scientific research, better farming techniques, and modern machinery, the following accomplishments have been attained:

It requires 22% less feed to produce a quart of milk than it did 40 years ago;

23% less feed to produce 1 dozen eggs;

29% less feed to produce a pound of chicken; and

32% less feed to produce a pound of pork.

Through the application of science we have increased the yields of most of our crops. For example, the average corn production has gone from 26 to over 38 bu. per acre during the past 40 years, but the man-hours required to produce 100 bu. of corn has dropped from 135 to 34. During that same time the man-hours to grow an acre of wheat has dropped from 15.2 to 4.4 hours. A ton of hay required 10.3 hours of labor compared to 4.6 hours today.

We could go on indefinitely, but we mention this only to show that agriculture is not in dire straits, as some would picture it. There may have been some recessions in income as compared with the peak level of 1947, but in spite of this farmers have made steady proogress in adding more and better equipment and machinery to the farm, and impressive gains are being made regardless of the great problems with which they have been faced.

Triangle Brand Copper Sulphate has been recognized as an effective agricultural chemical for more than sixty years. In sprays (where Bordeaux mixtures are the most reliable), in dusts (if you prefer them) and in fertilizers (for additional enrichment of the soil) Triangle Brand Copper Sulphate has proved itself worthy and dependable. Try these Triangle Brand forms of Copper Sulphates:

INSTANT (powder) for quick and efficient mixing or Bordeaux sprays.

SUPERFINE (snow), SMALL or LARGE CRYSTALS, all containing 25.2% metallic copper.

BASIC Copper Sulphate in powder form, containing 53% metallic copper.

Write for booklets that will help you solve your agricultural problems.

Control POND SCUM and ALGAE with Triangle Brand Copper Sulphate. Write today for information on how it can help you maintain healthy water conditions.

PHELPS DODGE REFINING CORP.
300 PARK AVE. NEW YORK 22, N.Y. • 5310 W. 66th STREET, CHICAGO 38, ILL.

Specific Problems Face Weed Conference

Problems in control of specific weeds in specific crops will be analyzed at the 10th annual meeting of the Southern Weed Conference in Augusta, Ga., Jan. 23-25.

The conference program will include all phases of research and education in chemical weed control, Dr. W. B. Albert, South Carolina Agricultural Experiment Station, Clemson, S. C., states. Dr. Albert is president of the conference.

Among the general topics planned for the program are fundamental aspects of weed control, control of specific weeds, control in specific crops, aquatic weed control, weed control in pastures and turf, weed control in non-crop areas, horticultural weed control, and new developments.

Dr. J. K. Leasure of Dow Chemical Co., Midland, Michigan, is chairman of the program committee.

All sessions of the conference will be held at the Bon Aire Hotel.

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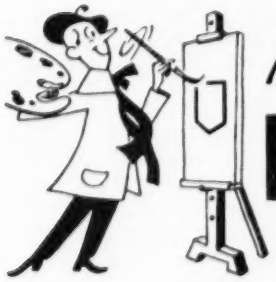

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INDUSTRY IS SERVING THE PUBLIC INTEREST

by Hugo Riemer,

President Nitrogen Division,
Allied Chemical & Dye Corp.

According to Webster's International Dictionary, Industry — spelled with a capital I—is "a well-known European variety of gooseberry."

This definition has tempted me to say that industry is a gooseberry which provides the public with the juice of life and civilization, and to go on from there—or, perhaps better, stop there. I have long hoped to hear a speech as short as that—with due respect for my predecessors on this program—but it is not what I was asked to do.

Further, it is a little misleading to think of industry as a gooseberry, that is, as something separate from the public which it serves. It seems to me more useful to say that industry is the exertion of effort by the public in its own interest. In other words, the act of squeezing the gooseberry to nourish the public.

This last notion is more or less supported by the most applicable among the Webster definitions, so let us go back to the dictionary. It says that industry is "systematic labor or habitual employment; especially, human exertion employed for the creation of value, regarded by some as a species of capital or wealth." May we conclude then, that industry is the application of human energy to the creation of wealth, that the service the American public has rendered itself is the development of industry on a sufficiently grand, bold scale to produce the goods and services necessary to fulfill our wants and to make us secure and strong? Through our industry, we can boast today of a higher standard of living than any other country can even imagine and at the same time a stronger national defense than most of us probably can comprehend.

However, these are only material things and familiar enough to us all to fall into the category of cliche. After the traditional, primary concerns of food, clothes and shelter are provided for, we are likely to turn to our deep convictions about liberty and the worth and the dignity of man as an individual, rather than as a cog in an impersonal state machine. Here again, in what for want of a better trem may be called the spiritual realm, industry is serving the public.

This, I know, is heresy. Industry, particularly the industrial manager, is supposed to be materialistic to an extreme and incapable of functioning in the spiritual realm. Perhaps so. We need not contest the point, but this I think we will all concede: it is the effectiveness of our application of capital and labor to the public interest, it is the productivity of our industry which has supplied the means to build and support our schools and colleges, our churches, our libraries, our museums, our symphonies, and has given us the leisure for cultural development.

Yes, even our leisure. For example, we are accustomed today to the 40-hour week and the two-day weekend. They represent a significant part of the gains Americans have achieved for themselves during our generation. However, you and I know that the 40-hour week would have impoverished the nation by depriving it of a substantial portion of the goods and services comprising its wealth and would have made impossible the high consumption of goods and services which makes our standard of living and national defense, if the productivity of industry had not increased.

We started with the 40-hour week in a period of depression when our surplus was manpower. We maintained it through the bustling period of preparedness, war and boom when manpower was short, by means of a tremendous surge of production.

Thus, through the 40-hour week among other things, industry in America is giving man back to himself. It is relieving him of the back-breaking, numbing, time-consuming toil once necessary to keep body and soul together and, in addition, it is providing him with enough of the material things to enable him to profit by his leisure.

There is another aspect of the service of industry to the public which is noteworthy. Perhaps one of man's strongest urges in the philosophical sense is self-realization. This I take to mean the full development of the individual personality and the exercise of his capabilities.

Industry is not only receptive, but possessed of an insatiable hunger for ideas. It is constantly looking for new and improved products, processes, equipment, ways of doing things, and has been liberal in the establishment of the facilities and atmosphere conducive to study, thought and discovery. It is perpetually attentive to the formation, strengthening and renewal of its production, sales, administrative and management groups. It offers unlimited opportunity and scope to the individual for accomplishment in the field of his greatest talent, as well as training to sharpen his talents and enhance his accomplishments for the advancement of industry, the benefit of the public and the greater personal satisfaction and reward of the individual.

I do not mean to suggest that industry is a philanthropic enterprise. As I said at the outset, industry is the means by which the public achieves its objectives of more and better goods and services. Under the terms upon which our society is organized, we rely on personal gain as the incentive to create industry, to participate in it and to carry it through for the public good. Further, we rely on profit to the industry to provide the means for its own renewal, diversification and expansion to supply the public need. The only alternative is direction and control by an all-knowing and all-powerful state, which of course would be the negation of freedom.

State controlled industry would have to operate according to plan and the plan would have to be carried out in detail; any deviation would destroy the plan and disorganize both industry and the state. Even assuming the ability of any leader or collective leadership to make such a plan for a complex society such as ours—success in this wherever attempted has not been notable without economic inbalance and human suffering and deprivation—such a system would kill all individual initiative toward anything new or better incompatible with the plan and leave us all mired

(Continued on page 75)

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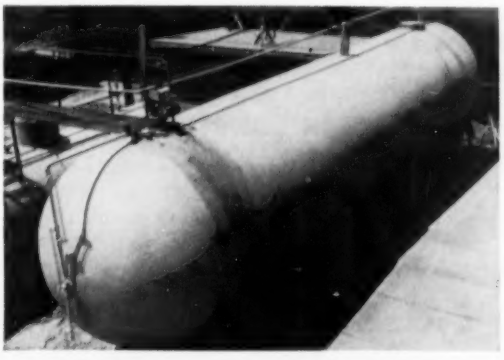

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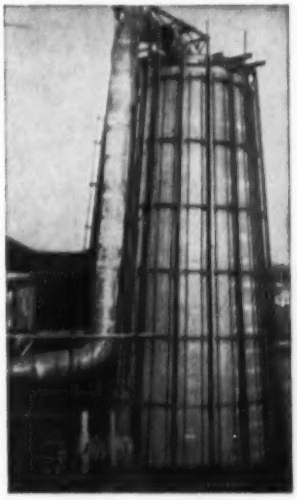

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RIEMER

(Continued from page 72)

in the muddy road of yesterday.

Except in the case of our national defense, our society is relatively speaking a planless society devoted to fulfilling the needs and desires of the public, whether these needs and desires are firm or shifting. We leave it pretty much to industry to determine such needs and desires and to satisfy them. The industrial unit which is successful in this respect will prosper. The unit which is unsuccessful must try again more fruitfully or fail. To the extent that industry succeeds in this endeavor, it serves the public in detail and the evidence is on every hand that it has done well—has done extremely well by individual effort, individual planning coordinated only by the desires of the public, without invasion of our individual freedom.

A pertinent correlary to what I have said up to now, is that industry is also serving the public by operating at a profit. As has been said, it is profit which sustains industry. Without profit, it could not survive and we would perforce pass into socialism and the stultification of our whole existence. All of which brings me to what may appear to some to be a rather extreme position that profit is not only the lifeblood of the free enterprise system, but also that profitable free enterprise is the essence of effective democracy.

You will no doubt infer from what has gone before that I am an advocate for a point of view and not impartial. That may be an imposition on you, except for the fact that my remarks have been unique in the respect that I have discussed and, I believe, demonstrated, the service of the public by industry, without once mentioning dollars, billions, or gross national product.

Thank you for your hospitality in inviting me here and giving me your kind attention.

New Sulfonates Developed For Use In Plant Foods

A series of new petroleum sulfonates that act both as a source of plant nutrients and as an agent for facilitating utilization of nutrients by plants is being developed by L. Sonneborn Sons, Inc., N. Y., for use by manufacturers of plant foods. Further information on and samples of the new petroleum sulfonates may be obtained by writing White Oil, Petrolatum & Sulfonate Div., L. Sonneborn Sons, Inc., 300 Fourth Ave., New York 10, N. Y.

Jacob Announces AOAC Wiley Award

Kenneth D. Jacob, president, Association of Official Agricultural Chemists, Oct. 15 announced establishment of the Harvey W. Wiley Award for analytical methods, at the Association's 70th annual banquet in Washington, D. C. The award honors the memory of the founder of the Federal pure food and drug law, who was also one of the founders of the Association.

This annual award, in the sum of $500, will be given to the scientist or group of scientists judged to have made an outstanding contribution to the development of methods of analysis in the fields of the Association's interest. The first award will be given at the 71st annual meeting of the association in Oct., 1957.

N Division Steps Up Outdoor Advertising

A major increase in outdoor posting is scheduled this fall for Allied Chemical & Dye Corp.'s Arcadian 12-12-12 fertilizer and Uran spray, following a test program in rural markets last winter by the company's Nitrogen Division. The expanded outdoor program, via Albert Sidney Noble, advertising agency will cover selected agricultural regions in twelve states, reports Outdoor advertising Incorporated. Posters are designed for long-range readability by farmers driving to and from market centers.

N Fertilizers Improve Range Conditions

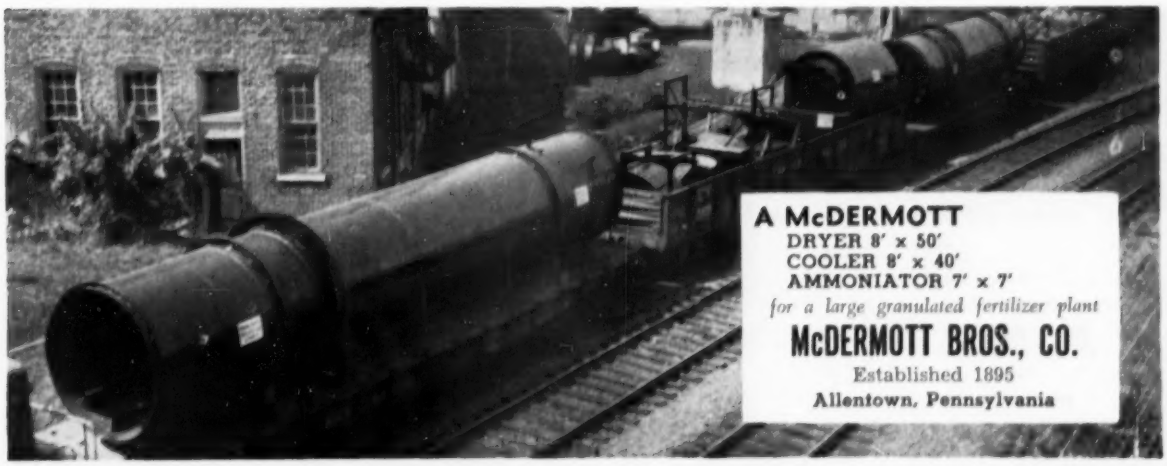
Applications of nitrogen can lead to rapid range improvement, help provide longer grazing periods, and aid in better distribution of livestock over grazing areas, USDA reports.

More efficient forage production and increased returns per acre were achieved when agronomists of USDA's Agricultural Research Service applied nitrogen as ammonium nitrate to range grasses in tests at the U. S. Northern Great Plains Field Station, Mandan, N. D.

The studies indicate that even though current prices of hay might not make nitrogen applications profitable, added weight gains in livestock grazed could more than pay the fertilizer costs.

During these 6-year field trials, dry matter yields averaged 2,271 pounds per acre from range fertilized with 90 pounds of nitrogen annually, and 1,326 pounds per acre when 30 pounds of nitrogen was applied annually. Without nitrogen, yields averaged only 748 pounds of dry matter per acre.

This marked yield response was obtained by applying nitrogen to soils already high in total nitrogen before the test. The added nitrogen



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increased the number of plants and stimulated growth of western wheatgrass, a high-yielding cool-season species.

Vegetative cover of western wheatgrass increased by 46 percent as a result of the 6-year application of nitrogen at 90 lbs. per acre. This tall grass is desirable on ranges, especially for winter grazing.

Nitrogen fertilizer, applied to heavily grazed native grasses, enabled these ranges to improve much more rapidly than did unfertilized ranges that were not grazed. The fertilizer also improved properly grazed pastures.

Percentage of crude protein in range herbage increased significantly when 90 pounds of nitrogen was applied per acre. Applications at the 30-pound rate apparently supplied only enough nitrogen for vigorous plant growth, leaving none for an increase in protein content.

'56 Acreage Reserve Payments Through Nov. 2

Payments to farmers participating in the 1956 Acreage Reserve program of the Soil Bank totaled $181,147,696.39 in 45 States and Puerto Rico reporting through November 2, 1956, the USDA announced.

This is the sixth report on payments (negotiable certificates) issued under the 1956 Acreage Reserve program. The fifth report, covering payments through October 26, showed a total of $139,653,543.40 disbursed in the 44 States from which reports were received.

In the final report on participation in the 1956 Acreage Reserve program (USDA 2464-56), the maximum amount of payments farmers could earn by remaining in compliance with the program was placed at nearly $261,000,000. Since then, the Department has authorized the termination or modification of 1956 Acreage Reserve agreements by farmers who misunderstood the terms of the program. Consequently, the total amount to be disbursed under the program is expected to be somewhat under that figure. No reports are available from States to indicate the extent to which farmers who signed Acreage Reserve agreements will modify or terminate them.

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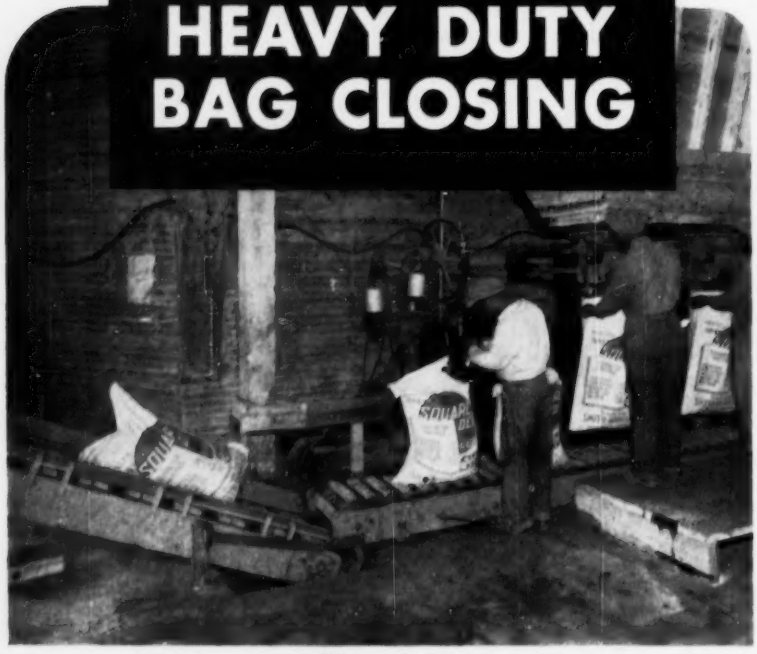

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